CANCER INCIDENCE AND MORTALITY IN DELAWARE, 2016-2020

DELAWARE DEPARTMENT OF HEALTH AND SOCIAL SERVICES
DIVISION OF PUBLIC HEALTH
2023

DELAWARE HEALTH AND SOCIAL SERVICES
Division of Public Health
Comprehensive Cancer Control Program

This report is made possible with funding from the Delaware Health Fund, with strategic leadership and guidance provided by the Delaware Cancer Consortium.

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EXECUTIVE SUMMARY

This report presents the 2016-2020 cancer incidence and mortality data and statistics for Delaware. The Delaware Department of Health and Social Services (DHSS), Division of Public Health (DPH), in conjunction with the Delaware Cancer Consortium (DCC), publishes this report as a source of cancer incidence and mortality information. DPH and other stakeholders also use this report to inform decisions on outreach and program strategies to combat cancer incidence and mortality in Delaware.

Cancer incidence (the number of new cancer cases in a population over a time period)[1] and mortality (the number of deaths from cancer in a population over a time period)[2] rates, and other analyses are performed by the Delaware Bureau of Cancer Prevention and Control staff. Incidence data are obtained from the Delaware Cancer Registry (DCR) and mortality data are obtained from the Delaware Health Statistics Center.

This report includes cancer statistics for all cancer sites combined (all-site cancer), as well as the top 23 site-specific cancer types: brain and other nervous system, cervix, colorectal, esophagus, female breast, Hodgkin lymphoma, kidney and renal pelvis, larynx, leukemia, liver and intrahepatic bile duct, lung and bronchus, melanoma, myeloma, non-Hodgkin lymphoma, ovary, oral cavity and pharynx, pancreas, prostate, stomach, testis, thyroid, uterine, and urinary bladder. These cancer statistics reflect incidence and mortality data for 2016-2020. DPH compares Delaware's cancer incidence and mortality statistics for 2016-2020 to those of the U.S. over the same period. DPH also summarizes how Delaware and U.S. cancer rates have changed from 2006 to 2020.

The COVID-19 pandemic resulted in delays and reductions in cancer screening and diagnosis, which subsequently lead to a decline in 2020 incidence counts and rates that was considered an anomaly. Inclusion of 2020 rates would bias the estimates of trends over time, and therefore, 2020 rates were not included in trend analysis.[3]

Between 2006 and 2019, incidence rates for all-site cancer decreased by an average of 1.1% per year in Delaware and an average of 0.6% per year in the U.S. While progress continues to be made, Delaware's 2016-2020 all-site cancer incidence rate (457.6 per 100,000 population) remains significantly higher than the comparable U.S. rate (442.2 per 100,000 population). Delaware currently ranks 20th among the states for highest all-site cancer incidence. Between 2006 and 2019, incidence rates for all-site cancer decreased an average of 1.9% per year among non-Hispanic White males and remained stable for non-Hispanic White females. During that same period, incidence rates for all-site cancer decreased an average of 2.1% per year among non-Hispanic Black males and decreased an average of 1.1% per year among non-Hispanic Black females. Between 2006 and 2020, the trend in incidence rates for all-site cancer was stable among both Hispanic males and Hispanic females.

Of the 23 site-specific cancers analyzed, Delaware had a significantly higher age-adjusted incidence rate for lung and bronchus, melanoma, urinary bladder, and thyroid cancers compared to the U.S. during 2016-2020. Delaware had a significantly lower age-adjusted leukemia incidence rate compared to the U.S during the same time period. Delaware males had a significantly higher age-adjusted incidence rate for melanoma, prostate, and urinary bladder compared to U.S. males during 2016-2020. Delaware females had a significantly higher age-adjusted incidence rate for lung and bronchus, melanoma, female breast, and thyroid cancer compared to U.S. females during 2016-2020. Delaware females had a significantly lower age-adjusted leukemia incidence

[1] https://seer.cancer.gov/statistics/types/incidence.html
[2] https://seer.cancer.gov/statistics/types/mortality.html
[3] National Cancer Institute, Surveillance, Epidemiology, and End Results Program: Impact of COVID on 2020 SEER Cancer Incidence Data, https://seer.cancer.gov/data/covid-impact.html

rate compared to U.S. females during this time period. Among the 17 non-sex specific cancers, Delaware males had higher age-adjusted incidence rates for 13 non-sex specific cancers compared to Delaware females during 2016-2020. Of the 17 non-sex specific cancers, only thyroid cancer was significantly higher among Delaware females compared to Delaware males during 2016-2020.

Delaware's 2016-2020 all-site cancer mortality rate of 156.8 per 100,000 population was significantly higher than the U.S. rate of 149.4 per 100,000 population. This difference in all-site cancer mortality rates was statistically significant. Although Delaware's all-site cancer mortality rate has historically been higher than the U.S. rate, the gap has narrowed over the last decade as the state continues to make strides in reducing the cancer mortality rate through cancer screening and early detection. Delaware's current ranking of 15th among the states for highest all-site cancer mortality is the same ranking as in the 2022 report, which examined the 2015-2019 time period. Though the ranking has increased since the 2011-2015 period when Delaware ranked 18th, it still represents considerable continued progress since the 1990s, when the state ranked second. In the 15-year period between 2006 and 2020, mortality rates for all-site cancer decreased an average of 1.8% per year in Delaware and decreased an average of 1.7% per year in the U.S. The decrease was consistent in Delaware over this time period, but the mortality rates in the U.S. had a greater average decrease of 2.0% between 2015 and 2020 compared to between 2006 and 2015 (1.5%).

Between 2006 and 2020, mortality rates for all-site cancer decreased by an average of 1.7% per year among non-Hispanic White males and decreased by an average of 1.9% per year among non-Hispanic White females. Between 2006 and 2020, mortality rates for all-site cancer decreased by an average of 2.1% per year among non-Hispanic Black males and remained stable for non-Hispanic Black females. Between 2006 and 2020, the trend in mortality rates for all-site cancer was stable among both Hispanic males and Hispanic females in Delaware.

Of the 23 site-specific cancers, Delaware had significantly higher age-adjusted mortality rates for pancreas, larynx, lung and bronchus, urinary bladder, and myeloma compared to the U.S from 2016-2020. Delaware males had a significantly higher age-adjusted mortality rates for lung, and bronchus, and urinary bladder cancers compared to U.S. males during the same time period. Delaware females had significantly higher age-adjusted mortality rates for lung and bronchus cancers compared to U.S. females during the same period. Among the 17 non-sex-specific cancers, Delaware males had higher age-adjusted mortality rates for 14 non-sex-specific specific cancers compared to Delaware females. Among the 17 non-sex-specific specific cancers, Delaware females did not have a significantly higher age-adjusted mortality rate compared to Delaware males.

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CHAPTER 1: INTRODUCTION

DELAWARE CANCER REGISTRY

The Delaware Cancer Registry (DCR) is managed by the Delaware Department of Health and Social Services (DHSS), Division of Public Health (DPH) and serves as the state's central cancer information center. The DCR was founded in 1972 and was legally established in 1980 under the Delaware Cancer Control Act[4]. The Act stipulated that all state hospitals, clinical laboratories, and cancer treatment centers report all new cancer cases to the DCR. In 1996, the Delaware Cancer Control Act was amended to require any health care practitioner who diagnoses or provides treatment to report cancer cases to the DCR. Further enhancements of the Delaware Cancer Control Act took effect in 2002 with the passage of Senate Bill 372 that which requires physicians to provide additional information to the DCR, including patients' duration of residence in Delaware and their occupational history. Senate Bill 372 also extended the reporting deadline to 180 days from initial diagnosis or treatment.

Today, Delaware is one of 46 states whose central cancer registry is supported by the National Program of Cancer Registries (NPCR) of the U.S. Centers for Disease Control and Prevention (CDC).[5] The DCR ensures accurate, timely, and routine surveillance of cancer trends among Delawareans.

REPORTING FACILITIES

Seven Delaware hospitals currently report cancer cases to the DCR. Non-hospital offices that submit data to the DCR include 15 diagnostic laboratories, 12 freestanding ambulatory surgery centers, and at least 20 physicians. Additionally, the DCR has reciprocal data exchange agreements with Alaska, Alabama, Arkansas, California, Colorado, Connecticut, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Louisiana, Maine, Maryland, Massachusetts, Michigan, Montana, Nebraska, Nevada, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Puerto Rico, Rhode Island, South Carolina, Tennessee, Texas, Utah, Virginia, Washington, Wisconsin, Wyoming, West Virginia, and the District of Columbia. Interstate data exchange agreements assist in identifying Delaware residents whose cancer was diagnosed and/or treated in another state.

DATA CONFIDENTIALITY

The DCR maintains patient confidentiality using a combination of techniques. Reporting facilities submit cancer data using computerized data encryption techniques. Published reports are limited to aggregate data, and requests for data releases are all reviewed by the Delaware Division of Public Health Privacy Board and need to be approved before release. Researchers who use DCR data must comply with regulations stated in DPH data use agreements and in some cases, obtain clearance from Delaware's Human Subjects Review Board.

DATA QUALITY

The DCR implements internal quality control procedures to verify the consistency of cancer data continually throughout the year as data is submitted by reporting facilities. In addition, the DCR strives to meet data consistency standards set by the North American Association of Central Cancer Registries (NAACCR). Data is submitted by DCR to NAACCR annually. The DCR also conducts record consolidation using a computerized matching program to identify multiple reports on the same individual. This scenario often arises when a patient is diagnosed and treated in two or more facilities, and each facility submits a cancer case reporting form to the DCR.

[4] http://delcode.delaware.gov/title16/c032/index.shtml
[5] https://nccd.cdc.gov/dcpc_Programs/index.aspx#/3

NAACCR CERTIFICATION AND NPCR STANDARD STATUS

In 1997, the NAACCR instituted a program to independently and annually review data from member registries for their completeness, accuracy, and timeliness. The registry certification metrics are pre-determined and established by NAACCR[6]. Gold or Silver Standard certifications are awarded following an evaluation of data quality, completeness, and timeliness of reporting. The DCR received Gold Standard certification for diagnosis in 1999, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, and 2020 (the most recent year for which complete data are currently available). The DCR received Silver Standard certification in 1998 and 2002.

Additionally, the NPCR provides an annual Standard Status Report to state cancer registries supported by the CDC. Delaware's data submissions for diagnosis years 2000 through 2020 surpassed all standard levels for quality, completeness, and timeliness.

USES OF DATA

DPH uses DCR data to support various programs and initiatives, including the Screening for Life (SFL) program and the Delaware Cancer Treatment Program. DPH also uses DCR data to investigate citizen inquiries and provide up-to-date cancer statistics to Delaware residents, hospitals, health care providers, community organizations, federal agencies, research institutions, and academic institutions. Committees associated with the Delaware Cancer Consortium (DCC) utilize DCR data to monitor cancer trends across the state, promote research, and guide policy planning.

COVID-19 IMPACT ON CANCER INCIDENCE

The November 2022 SEER data submission includes new cancer cases diagnosed in 2020, the first year of the Coronavirus 2019 (COVID-19) pandemic. The pandemic resulted in delays and reductions in cancer screening and diagnosis, which subsequently led to a decline in 2020 incidence counts and rates that was considered a temporary, anomalous year. Inclusion of 2020 rates would bias the estimates of trends over time, and therefore, 2020 rates were not included in trend analysis.[7]

Caution should be taken when making comparisons of cancer incidence data that include 2020 with other time periods, as decreases in incidence counts and rates may primarily be due to the effects of COVID-19 rather than decreases due to cancer control efforts.

[6] https://www.naaccr.org/certification-criteria/
[7] National Cancer Institute, Surveillance, Epidemiology, and End Results Program: Impact of COVID on 2020 SEER Cancer Incidence Data, https://seer.cancer.gov/data/covid-impact.html

ORGANIZATION OF THIS REPORT

This report includes cancer statistics for all cancer sites combined (all-site cancer) and the top 23 site-specific cancers. Cancer statistics reflect incidence and mortality data for 2016-2020. Delaware's cancer incidence and mortality statistics for 2016-2020 are compared to the U.S. over the same time period. Changes in Delaware and U.S. cancer incidence and mortality rates are shown from 2006 through 2020 using Joinpoint trend analysis. While 2020 is included in the graphs, data is not included since this year would bias estimates of trends over time. In addition to incidence and mortality, age-specific statistics are presented. In many cases, these statistics are also often calculated separately by sex, race, county of residence, and age group.

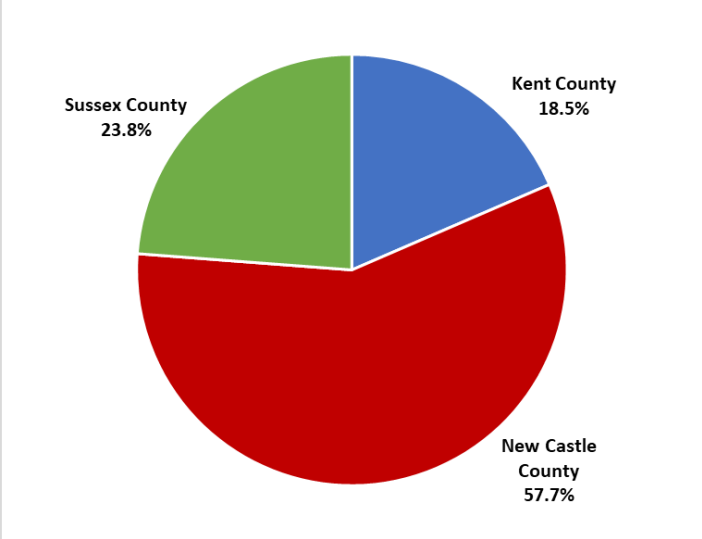
Data regarding cancer screening recommendations and compliance are presented in Appendix D. Behavioral risk factor data relevant to adult Delawareans are presented in Appendix E.

Delaware's 2016-2020 cancer incidence and mortality rankings among all 50 U.S. states are provided for each cancer site included in the report. State rankings for cancer incidence and mortality were obtained from the U.S. Cancer Statistics Working Group[8].

DELAWARE'S POPULATION

In 2016-2020, census data estimated Delaware's total average population at 967,679. Approximately 58% of Delawareans reside in New Castle County. Kent and Sussex counties are home to 18.5% and 23.8% of Delawareans, respectively (Figure 2-1).

FIGURE 1-1: PERCENTAGE OF POPULATION BY COUNTY, DELAWARE, 2016-2020

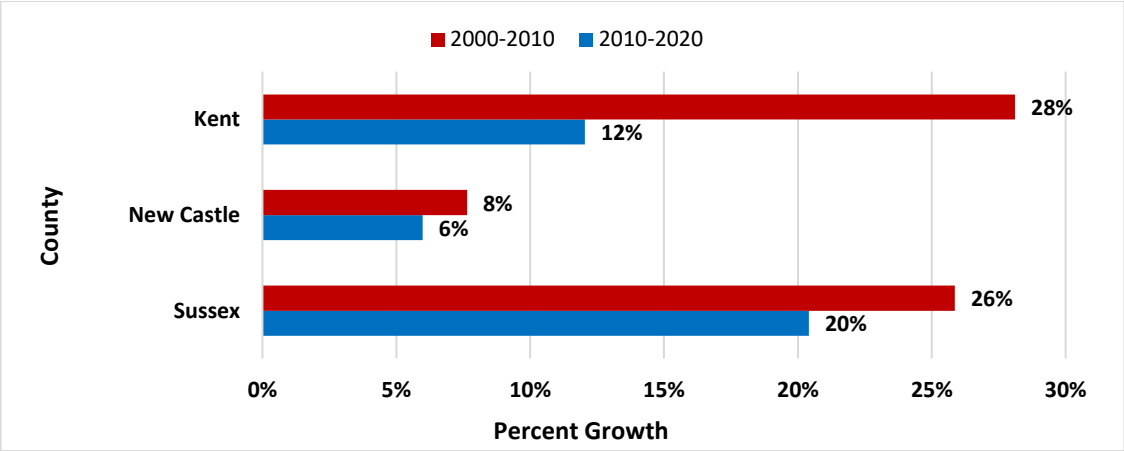


Source: U.S. Census Bureau, 2016-2020 American Community Survey 5-Year Estimates, https://data.census.gov/.

Since 2000, population growth rates have varied across Delaware counties (Figure 2-2). New Castle County is Delaware's most populated county. New Castle County experienced the smallest population growth from 2010 to 2020, while Sussex County experienced the largest population growth from 2010 to 2020.

[8] U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on 2021 submission data (1999-2019): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, released in June 2022.

FIGURE 1-2: PERCENTAGE OF POPULATION GROWTH BY COUNTY AND DECADE, DELAWARE, 2000-2010 AND 2010-2020



Source: U.S. Census Bureau 2020, https://data.census.gov/

Census data from 2016-2020 show that the majority of Delawareans are non-Hispanic White, followed by non-Hispanic Black, then Hispanic. Four percent of Delawareans are considered "other" race, which is defined as: (a) any other race group that was too small to enumerate separately; (b) unknown race; or (c) mixed race (i.e., two or more races).

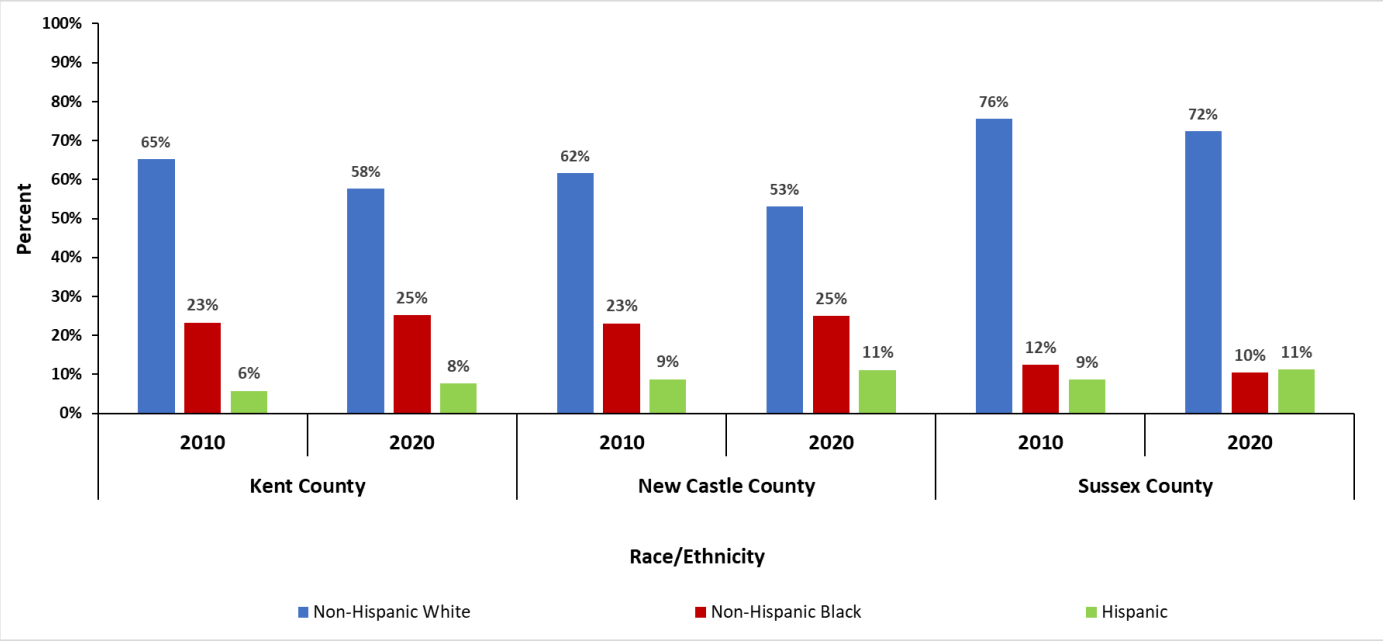
TABLE 1-1: PERCENTAGE OF POPULATION BY RACE/ETHNICITY AND COUNTY, DELAWARE, 2016-2020

Race/Ethnicity	Delaware	Kent	New Castle	Sussex
Not Hispanic or Latino				
White	61.5%	60.6%	56.4%	74.6%
Black	21.5%	25.0%	24.7%	11.2%
American Indian and Alaska Native	0.3%	0.5%	0.2%	0.3%
Asian	4.0%	2.1%	5.7%	1.2%
Native Hawaiian and Other Pacific Islander	0.0%	0.0%	0.0%	0.0%
Other race	0.4%	0.3%	0.3%	0.6%
Two or more races	2.9%	4.3%	2.5%	2.7%
Hispanic or Latino	9.5%	7.3%	10.2%	9.2%

Source: U.S. Census Bureau, 2016-2020 American Community Survey 5-Year Estimates, https://data.census.gov/.

Since 2010, racial diversity has expanded at different rates across Delaware's counties. Both Kent and New Castle counties experienced increases in the proportion of non-Hispanic Black and Hispanic residents (and concurrent decreases in the proportion of non-Hispanic White residents) from 2010 to 2020 (Figure 2-3). A different trend was observed in Sussex County, where the non-Hispanic Black population decreased from 2010 to 2020. However, similar to the trends in the other counties, the non-Hispanic White population declined while the Hispanic population increased.

FIGURE 1-3: PERCENTAGE OF RESIDENTS BY RACE/ETHNICITY, DELAWARE AND COUNTIES, 2010 AND 2020



Source: U.S. Census Bureau 2020, https://data.census.gov/

GUIDELINES FOR INTERPRETATION OF INCIDENCE AND MORTALITY RATES

Incidence and mortality rates for Delaware are expressed per 100,000 Delawareans and rates for the U.S. are expressed per 100,000 U.S. residents. Due to Delaware's small population base, cancer rates were calculated using five-year calendar year groupings for both cancer incidence and mortality.

Cancer incidence and mortality rates were adjusted by age to enable comparisons between populations that may have different age distributions (e.g., Delaware vs. the U.S.). Thus, age-adjusted cancer rates can be compared without any concern about how differences in age distribution of the populations would affect cancer rates. The standard population used to adjust for age is the 2000 U.S. population.

Ninety-five percent confidence intervals were computed for each cancer rate. Confidence intervals represent the range of values in which the cancer rate could reasonably fall 95% of the time. They are used to determine whether the amount by which two cancer rates differ is statistically significant. If the confidence interval for one rate does not overlap with the confidence interval for another rate, the two rates are significantly different, upon exploratory analysis. When one rate is significantly different from another rate, it is assumed the difference between the rates is larger than would be expected by chance alone, meaning it is statistically significant. If the confidence interval for one rate overlaps with the confidence interval for another rate, the two rates are not statistically significantly different, commonly referred to as "no meaningful difference" between rates. However, because confidence rates are based on the number cases, rates based on fewer cases will have a wider confidence interval. Likewise, rates based on many cases will have a narrower confidence interval. Confidence intervals are subject to both Type I and Type II errors. Therefore, in this report rates between two or more populations with confidence intervals that do not overlap have an incidence rate ratio calculated. If both the confidence interval method and the incidence rate ratio prove to be statistically significant at the $p < 0.05$ level, these differences are determined to be confirmed and written as such in the body of the document.

For this report, cancer frequencies and rates were suppressed according to the CDC's United States Cancer Statistics Suppression of Rates[9] and:

- Incidence and mortality frequencies of fewer than 16 were not shown to protect patient privacy and confidentiality. In some instances, additional cells were suppressed so that one cannot deduce the actual count in the initially suppressed cell. Suppressing incidence and mortality statistics based on a small number of cancer cases or deaths helps protect patient privacy and confidentiality.[10,11]
- Age-adjusted incidence and mortality rates based on fewer than 16 cases or deaths were suppressed as they are inherently unstable and cannot be reliably interpreted.

[9] Centers for Disease Control and Prevention. (2023, June 8). *Statistical methods: Suppression of rates and counts*. United States Cancer Statistics (USCS). Retrieved August 23, 2023, from https://www.cdc.gov/cancer/uscs/technical_notes/stat_methods/suppression.htm
[10] Coughlin SS, Clutter GG, Hutton M. Ethics in Cancer Registries. *Journal of Cancer Registry Management, 2:* 5-10, 1999.
[11] McLaughlin CC. Confidentiality protection in publicly released central registry data. *Journal of Cancer Registry Management, 2:* 84-88, 2002.

CHAPTER 2: ALL-SITE CANCER

INCIDENCE

For 2016-2020, Delaware ranked 21st in the U.S. for all-site cancer incidence (13th in 2015-2019); males ranked 18th (11th in 2015-2019) and females ranked 24th (13th in 2015-2019)[12].

2016-2020 DATA

TABLE 2-1: NUMBER OF ALL-SITE CANCER CASES, BY SEX AND RACE/ETHNICITY; DELAWARE AND COUNTIES, 2016-2020

	All Races			Non-Hispanic White			Non-Hispanic Black			Hispanic		
	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	29,805	15,289	14,516	22,810	11,773	11,037	4,981	2,486	2,495	968	432	536
Kent	5,512	2,883	2,629	4,074	2,105	1,969	1,084	578	506	184	95	89
New Castle	15,399	7,568	7,831	10,878	5,358	5,520	3,244	1,574	1,670	617	270	347
Sussex	8,880	4,831	4,049	7,853	4,308	3,545	647	330	317	166	67	99

Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2023.

Note: 'All Races' includes Non-Hispanic White, Non-Hispanic Black, and Hispanic which are shown in the table, as well as other racial/ethnic groups that are not included in the table (e.g., non-Hispanic Asian and Pacific Islander, non-Hispanic American Indian/Alaska Native, unknown race/ethnicity, and other non-specified race).

- In Delaware in 2016-2020:
  - There were 29,805 new all-site cancer cases diagnosed, an average of 5,961 per year.
  - Males accounted for 51% of all-site cancer cases.
  - Non-Hispanic Whites accounted for 77% of all-site cancer cases.

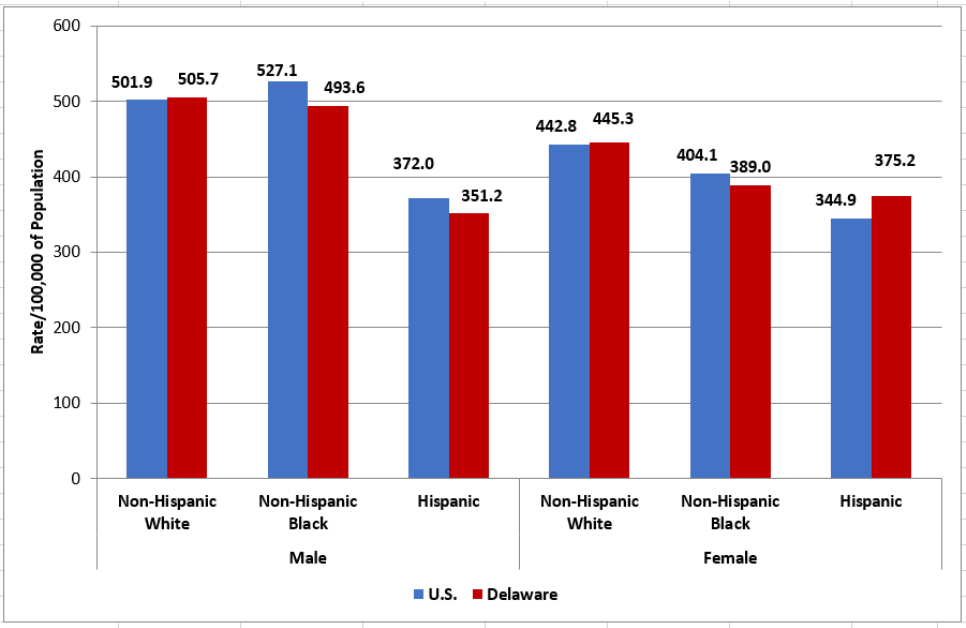
TABLE 2-2: FIVE-YEAR AVERAGE AGE-ADJUSTED ALL-SITE CANCER INCIDENCE RATES OVERALL AND BY SEX; U.S., DELAWARE, AND COUNTIES, 2016-2020

	Overall	Male	Female
U.S.	442.2	480.4	416.4
Delaware	457.6	500.1	426.9
Kent	494.0	553.5	448.7
New Castle	455.1	488.4	433.6
Sussex	442.0	489.7	404.3

Source (Delaware): Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2023.
Source (U.S.): National Program of Cancer Registries and Surveillance, Epidemiology, and End Results Program SEER*Stat Database: U.S. Cancer Statistics 2001–2020 Public Use Research Database, 2022 submission
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population.

[12] U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on November 2022 submission data (1999-2020): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, June 2023.

FIGURE 2-1: FIVE-YEAR AVERAGE AGE-ADJUSTED ALL-SITE CANCER INCIDENCE RATES BY SEX AND RACE/ETHNICITY; U.S. AND DELAWARE, 2016-2020

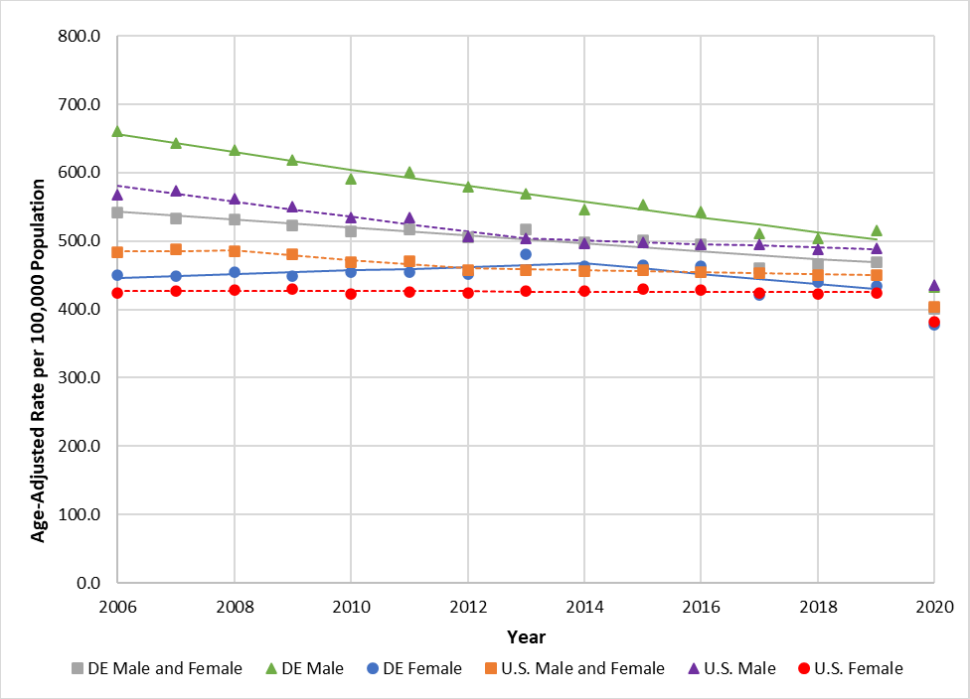


Source (Delaware): Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2023. Source (U.S.): National Program of Cancer Registries and Surveillance, Epidemiology, and End Results Program SEER*Stat Database: U.S. Cancer Statistics 2001–2020 Public Use Research Database, 2022 submission
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population and are calculated using modified U.S. Census populations available from NCI (https://seer.cancer.gov/popdata/).

- In Delaware from 2016-2020:
  - Males (500.1 per 100,000 population) had a statistically significantly higher all-site cancer incidence rate compared to females (426.9 per 100,000 population).
  - The difference in all-site cancer incidence rates between non-Hispanic Whites (470.3 per 100,000 population) and non-Hispanic Blacks (432.1 per 100,000 population) was statistically significant.
  - Hispanics (360.7 per 100,000 population) had a statistically significantly lower all-site cancer incidence rate compared to both non-Hispanic Whites (470.3 per 100,000 population) and non-Hispanic Blacks (432.1 per 100,000 population).
- Comparing Delaware and the U.S. from 2016-2020:
  - Delaware (457.6 per 100,000 population) had a statistically significantly higher all-site cancer incidence rate compared to the U.S. (442.2 per 100,000 population).
  - Delaware males (500.1 per 100,000 population) had a statistically significantly higher all-site cancer incidence rate compared to U.S. males (480.4 per 100,000 population).
  - Delaware females (426.9 per 100,000 population) had a statistically significantly higher all-site cancer incidence rate compared to U.S. females (416.4 per 100,000 population).
  - Non-Hispanic Whites in Delaware (470.3 per 100,000 population) had a statistically significantly higher all-site cancer incidence rate compared to non-Hispanic Whites in the U.S. (461.7 per 100,000 population).

- The difference in all-site cancer incidence rates between non-Hispanic Blacks in Delaware (432.1 per 100,000 population) and non-Hispanic Blacks in the U.S. (444.9 per 100,000 population) was not statistically significant.
- The difference in all-site cancer incidence rates between Hispanics in Delaware (360.7 per 100,000 population) and Hispanics in the U.S. (339.2 per 100,000) was not statistically significant.

FIGURE 2-2: AGE-ADJUSTED ALL-SITE CANCER INCIDENCE RATE TREND BY SEX; U.S. AND DELAWARE, 2006-2020*

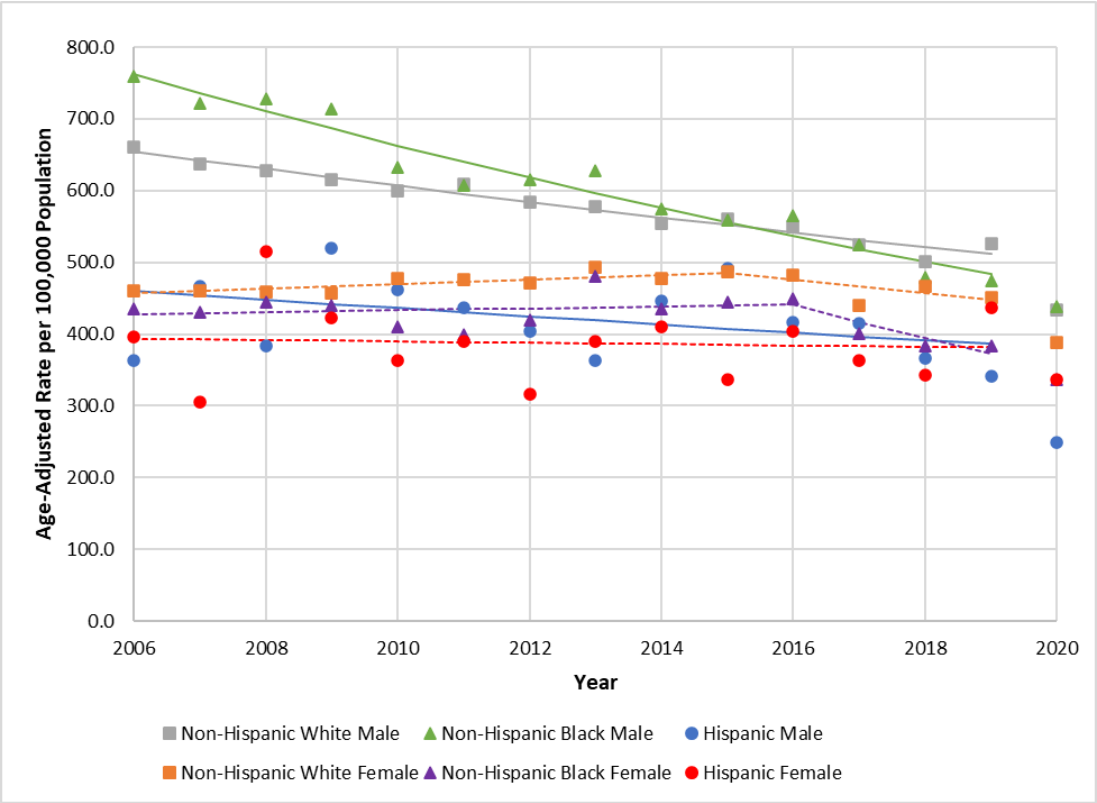


Source (Delaware): Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2023. Source (U.S.): National Program of Cancer Registries and Surveillance, Epidemiology, and End Results Program SEER*Stat Database: U.S. Cancer Statistics 2001–2020 Public Use Research Database, 2022 submission
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population and are calculated using modified U.S. Census populations available from NCI (https://seer.cancer.gov/popdata/).
*Incidence rates for year 2020 are plotted but were not used for the analysis of trends since 2020 was an anomaly and would bias estimates.

- Comparing age-adjusted all-site cancer incidence rates between the U.S. and Delaware between 2006 and 2019*:
  - Incidence rates for all-site cancer decreased an average of 1.1% per year in Delaware and an average of 0.6% per year in the U.S.
  - Incidence rates for all-site cancer decreased an average of 2.0% per year among Delaware males and decreased an average of 1.3% per year among U.S. males.
  - The trend in incidence rates for all-site cancer was stable among both Delaware females and U.S. females. However, when examining shorter periods across these years, the incidence rates for all-site cancer increased an average of 0.6% per year between 2006 and 2014 and decreased an average of 1.7% per year between 2014 and 2019 among Delaware females.

* The COVID-19 pandemic resulted in delays and reductions in cancer screening and diagnosis, which subsequently lead to a decline in 2020 incidence counts and rates that was considered an anomaly. Inclusion of 2020 rates would bias the estimates of trends over time, and therefore, 2020 rates were not included in trend analysis.

FIGURE 2-3: AGE-ADJUSTED ALL-SITE CANCER INCIDENCE RATE TREND BY SEX AND RACE/ETHNICITY; DELAWARE, 2006-2020*

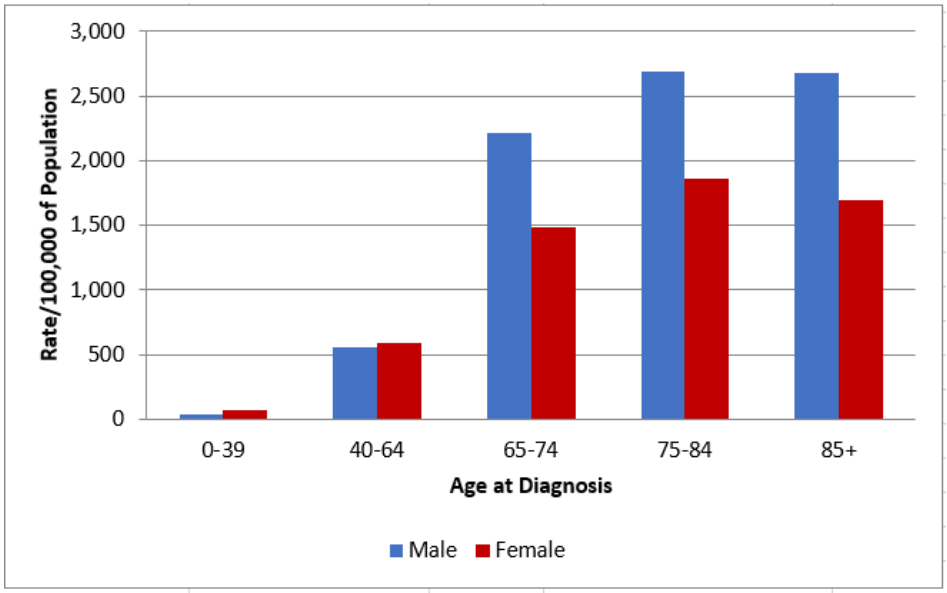


Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2023
Rates are per 100,000 of population using US Census estimates and age-adjusted to the 2000 U.S. standard population and are calculated using modified U.S. Census populations available from NCI (https://seer.cancer.gov/popdata/).
*Incidence rates for year 2020 are plotted but were not used for the analysis of trends since 2020 was an anomaly and would bias estimates.

- Comparing age-adjusted all-site cancer incidence rates by sex and race/ethnicity in Delaware between 2006 and 2019*:
  - Incidence rates for all-site cancer decreased an average of 1.9% per year among non-Hispanic White males and remained stable for non-Hispanic White females. However, when examining shorter periods across these years, the incidence rates for all-site cancer increased an average of 0.7% per year between 2006 and 2015 and decreased an average of 2.0% per year between 2015 and 2019 among non-Hispanic White females.
  - Incidence rates for all-site cancer decreased an average of 2.1% per year among non-Hispanic Black males and decreased an average of 1.1% per year among non-Hispanic Black females, with the largest decrease occurring between 2016 and 2019 at an average of 5.5% per year.
  - The trend in incidence rates for all-site cancer were stable among both Hispanic males and Hispanic females.

* The COVID-19 pandemic resulted in delays and reductions in cancer screening and diagnosis, which subsequently lead to a decline in 2020 incidence counts and rates that was considered an anomaly. Inclusion of 2020 rates would bias the estimates of trends over time, and therefore, 2020 rates were not included in trend analysis.

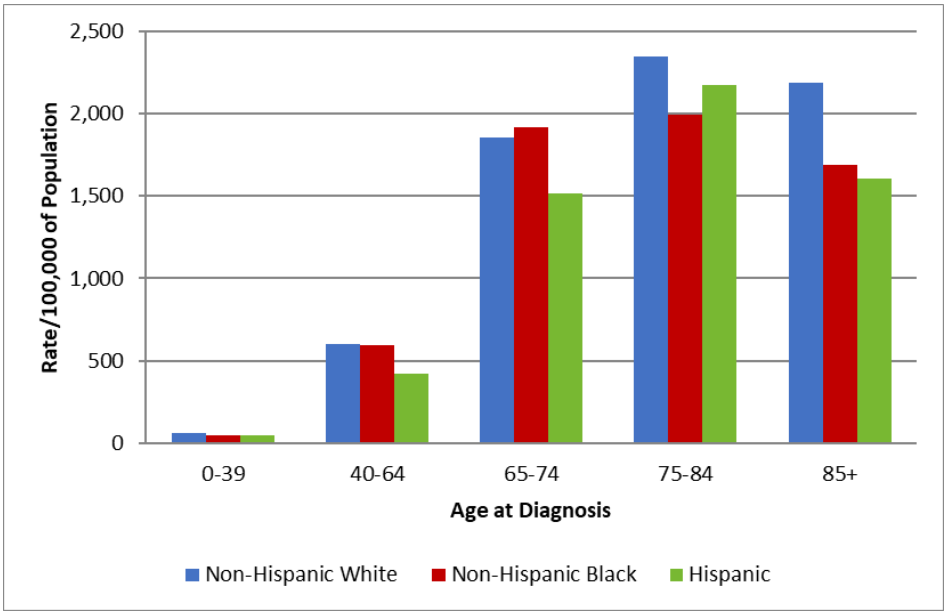
FIGURE 2-4: AGE-SPECIFIC ALL-SITE CANCER INCIDENCE RATES BY SEX; DELAWARE, 2016-2020



Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2023.
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population and are calculated using modified U.S. Census populations available from NCI (https://seer.cancer.gov/popdata/).

- In 2016-2020 in Delaware, the all-site cancer incidence rate was highest for males 85 years of age and older and for females between 75 and 84 years of age.

FIGURE 2-5: AGE-SPECIFIC ALL-SITE CANCER INCIDENCE RATES BY RACE/ETHNICITY; DELAWARE, 2016-2020



Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2023.
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population and are calculated using modified U.S. Census populations available from NCI (https://seer.cancer.gov/popdata/).

- Delaware's 2016-2020 all-site cancer incidence rate was highest for non-Hispanic Whites, non-Hispanic Blacks, and Hispanics between 75 and 84 years of age.

TABLE 2-3: AGE-SPECIFIC ALL-SITE CANCER INCIDENCE RATES BY SEX AND RACE/ETHNICITY; DELAWARE, 2016-2020

Age at Diagnosis	Non-Hispanic White			Non-Hispanic Black			Hispanic		
	All	Male	Female	All	Male	Female	All	Male	Female
0-39	61.8	45.8	77.5	43.9	37.9	49.3	52.2	33.9	72.2
40-64	586.8	553.9	619.3	570.3	595.6	550.8	409.2	354.0	467.5
65-74	1824.2	2174.2	1516.3	1826.0	2383.0	1414.2	1410.0	1530.2	1304.7
75-84	2303.6	2771.3	1917.4	1923.4	2255.4	1692.2	1953.5	2004.2	1915.9
85+	2127.3	2794.3	1731.2	1738.8	2100.0	1563.6	1669.3	2152.5	----

Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Cancer Registry, 2023.
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population and are calculated using modified U.S. Census populations available from NCI (https://seer.cancer.gov/popdata/).
--- Rates based on less than 16 cases are not shown.

- In 2016-2020, the all-site cancer incidence rate was highest for non-Hispanic White and Hispanic males 85 years of age and older and for non-Hispanic Black and Hispanic males between 65 and 74 years of age.
- The 2016-2020 all-site cancer incidence rate was highest for non-Hispanic White and Hispanic females between 75 and 84 years of age and for non-Hispanic Black females 75 and 84 years.

MORTALITY

For 2016-2020, Delaware ranked 15th in the U.S. for all-site cancer mortality (15th in 2015-2019); males ranked 14th (14th in 2015-2019) and females ranked 19th (17th in 2015-2019)[13].

2016-2020 DATA

TABLE 2-4: NUMBER OF ALL-SITE CANCER DEATHS, BY SEX AND RACE/ETHNICITY; DELAWARE AND COUNTIES, 2016-2020

	All Races			Non-Hispanic White			Non-Hispanic Black			Hispanic		
	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female
Delaware	10,439	5,583	4,856	8,187	4,450	3,737	1,842	896	946	242	142	100
Kent	1,891	990	901	1,425	754	671	375	179	196	52	34	18
New Castle	5,357	2,809	2,548	3,850	2,056	1,794	1,248	604	644	158	91	67
Sussex	3,191	1,784	1,407	2,912	1,640	1,272	219	113	106	32	17	15

Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, 2023.

- In Delaware in 2016-2020:
  - There were 10,439 deaths from cancer, an average of 2,087 per year.
  - Males accounted for 53% of all-site cancer deaths.
  - Non-Hispanic Whites accounted for 78% of all-site cancer deaths.

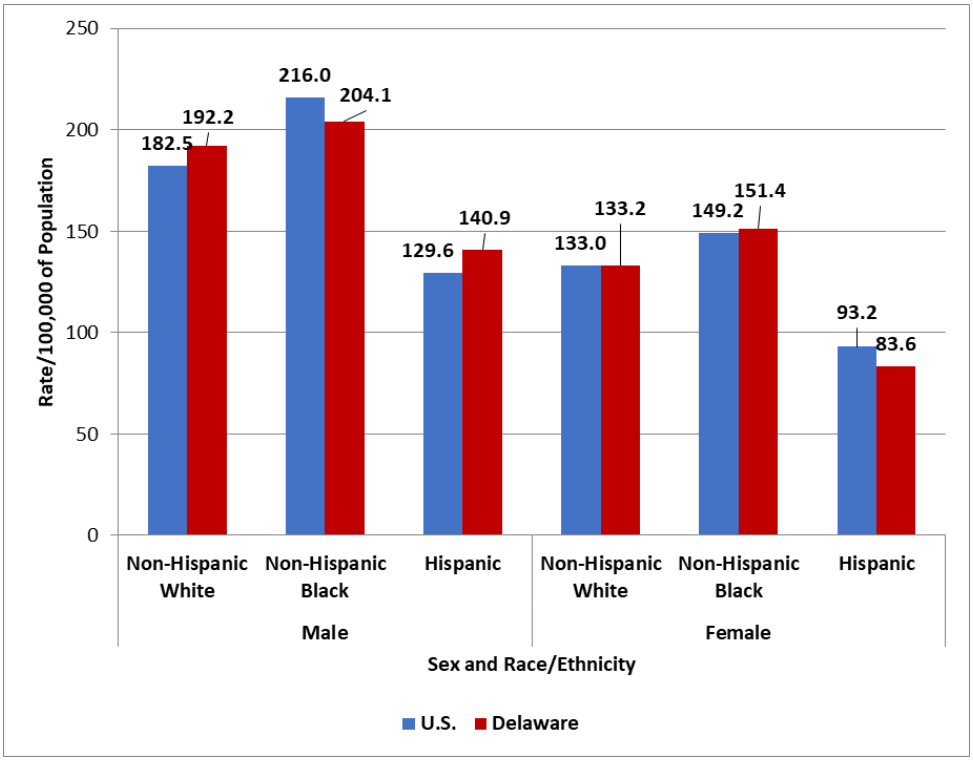
TABLE 2-5: FIVE-YEAR AVERAGE AGE-ADJUSTED ALL-SITE CANCER MORTALITY RATES OVERALL AND BY SEX; U.S., DELAWARE, AND COUNTIES, 2016-2020

	Overall	Male	Female
U.S.	149.4	177.5	128.7
Delaware	156.8	188.8	132.8
Kent	166.2	196.5	143.3
New Castle	158.2	191.8	134.2
Sussex	150.8	182.0	125.9

Source (Delaware): Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, 2023.
*Source (U.S.): Surveillance, Epidemiology, and End Results (SEER) Program, SEER*Stat Database: Mortality - All COD, Aggregated With State, Total U.S. (1990-2020)*
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population and are calculated using modified U.S. Census populations available from NCI (https://seer.cancer.gov/popdata/).

[13] U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on 2021 submission data (1999-2019): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, released in June 2022.

FIGURE 2-6: FIVE-YEAR AVERAGE AGE-ADJUSTED ALL-SITE CANCER MORTALITY RATES BY SEX AND RACE/ETHNICITY; U.S. AND DELAWARE, 2016-2020

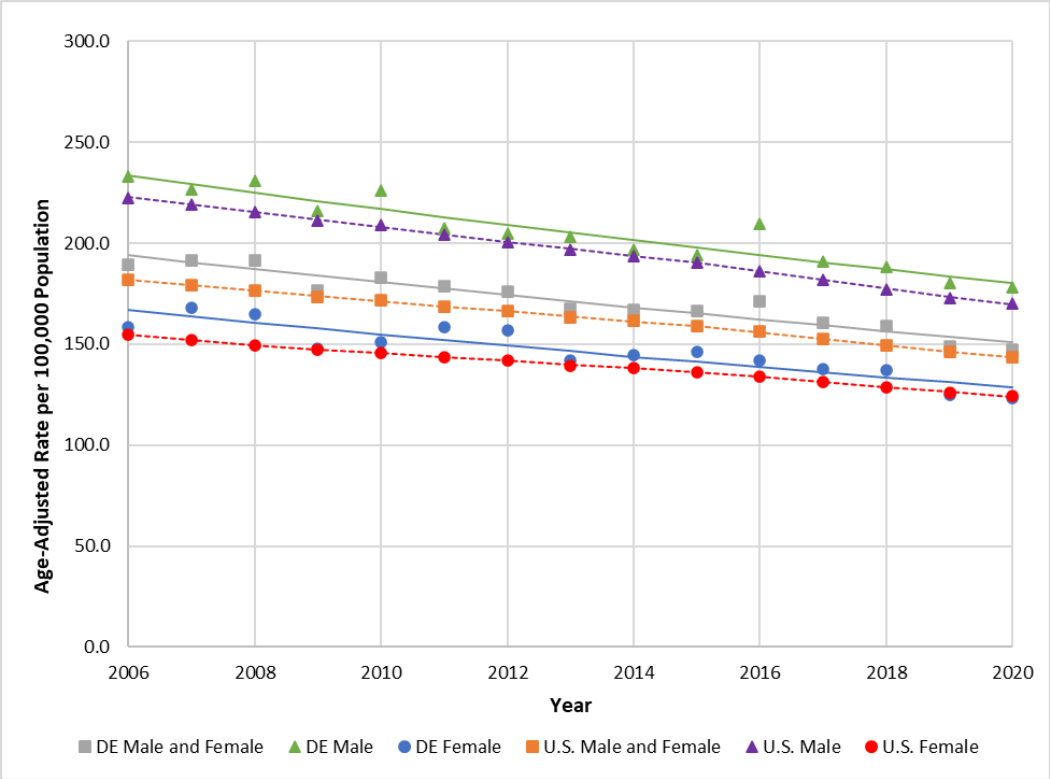


Source (Delaware): Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, 2023.
*Source (U.S.): Surveillance, Epidemiology, and End Results (SEER)*Stat Database: Mortality - All COD, Aggregated With State, Total U.S. (1990-2020)*
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population and are calculated using modified U.S. Census populations available from NCI (https://seer.cancer.gov/popdata/).

- In Delaware from 2016-2020:
  - Males (188.8 per 100,000 population) had a statistically significantly higher all-site cancer mortality rate compared to females (132.8 per 100,000 population).
  - Non-Hispanic Blacks (171.1 per 100,000 population) had a statistically significantly higher all-site cancer mortality rate compared to Hispanics (110.0 per 100,000 population) and compared to non-Hispanic Whites (158.9 per 100,000 population).
  - Non-Hispanic Whites (158.9 per 100,000 population) had a statistically significantly higher all-site cancer mortality rate compared to Hispanics (110.0 per 100,000 population).
- Comparing Delaware and the U.S. from 2016-2020:
  - Delaware (156.8 per 100,000 population) had a statistically significantly higher all-site cancer mortality rate compared to the U.S. (149.4 per 100,000 population).
  - Delaware males (188.8 per 100,000 population) had a statistically significantly higher all-site cancer mortality rate compared to U.S. males (177.5 per 100,000 population).
  - The difference in all-site cancer mortality rates between Delaware females (132.8 per 100,000 population) and U.S. females (128.7 per 100,000 population) was not statistically significant.

- Non-Hispanic Whites in Delaware (158.9 per 100,000 population) had a statistically significantly higher all-site cancer mortality rate compared to non-Hispanic Whites in the U.S. (154.4 per 100,000 population).
- The difference in all-site cancer mortality rates between non-Hispanic Blacks in Delaware (171.7 per 100,000 population) and the U.S. (174.7 per 100,000 population) was not statistically significant.
- The difference in all-site cancer mortality rates between Hispanics in Delaware (110.0 per 100,000 population) and the U.S. (108.2 per 100,000 population) was not statistically significant.

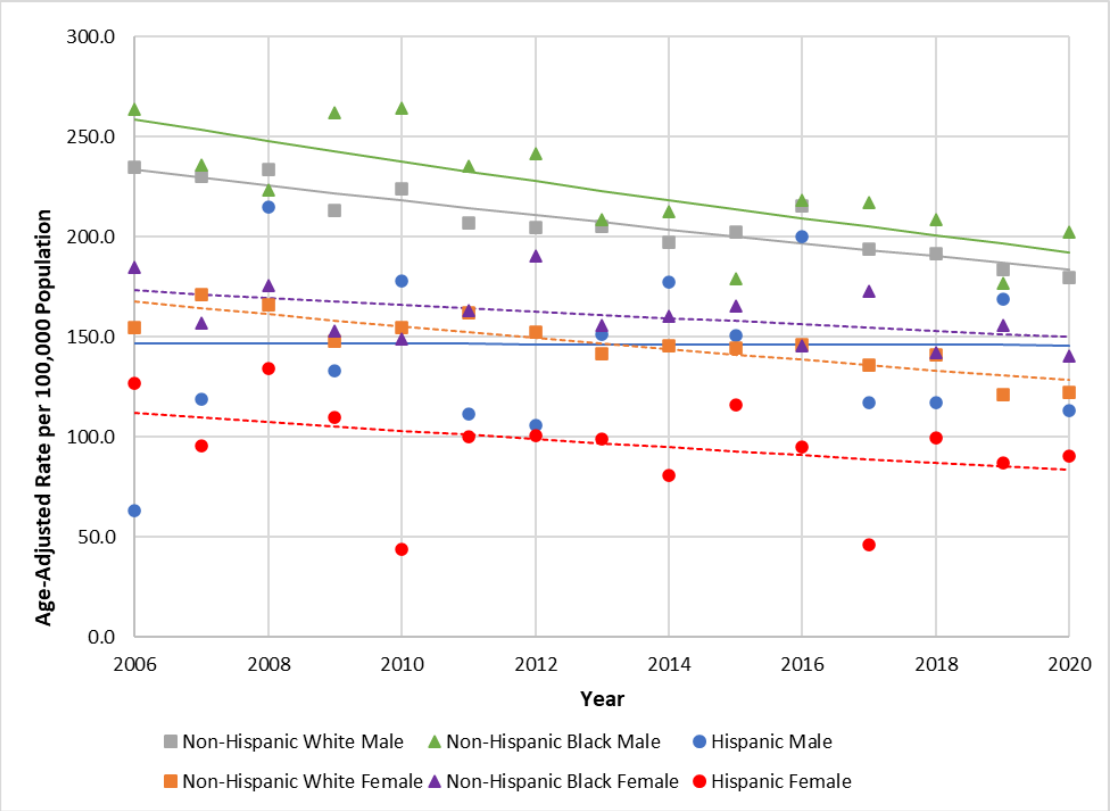
FIGURE 2-7: AGE-ADJUSTED ALL-SITE CANCER MORTALITY RATE TREND BY SEX; U.S. AND DELAWARE, 2006-2020



Source (Delaware): Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, 2023.
*Source (U.S.): Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Mortality - All COD, Aggregated With State, Total U.S. (1990-2020)*
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population and are calculated using modified U.S. Census populations available from NCI (https://seer.cancer.gov/popdata/).

- Comparing age-adjusted all-site cancer mortality rates between the U.S. and Delaware between 2006 and 2020:
  - Mortality rates for all-site cancer decreased an average of 1.8% per year in Delaware and decreased an average of 1.7% per year in the U.S. The decrease was consistent in Delaware over this time period, but the mortality rates in the U.S. had a greater average decrease of 2.0% between 2015 and 2020 compared to between 2006 and 2015 (1.5%).
  - Mortality rates for all-site cancer decreased an average of 1.8% per year among Delaware males and decreased an average of 1.9% per year among U.S. males. The decrease was consistent in Delaware males over this time period, but the mortality rates among U.S. males had a greater average decrease of 2.3% between 2015 and 2020 compared to between 2006 and 2015 (1.8%).
  - Mortality rates for all-site cancer decreased an average of 1.8% per year among Delaware females and decreased an average of 1.6% per year among U.S. females. The decrease was consistent in Delaware females over this time period, but the mortality rates among U.S. females had the greatest average decrease of 1.9% between 2015 and 2020 compared to between 2006 and 2008 (1.7%) and between 2008 and 2015 (1.3%).

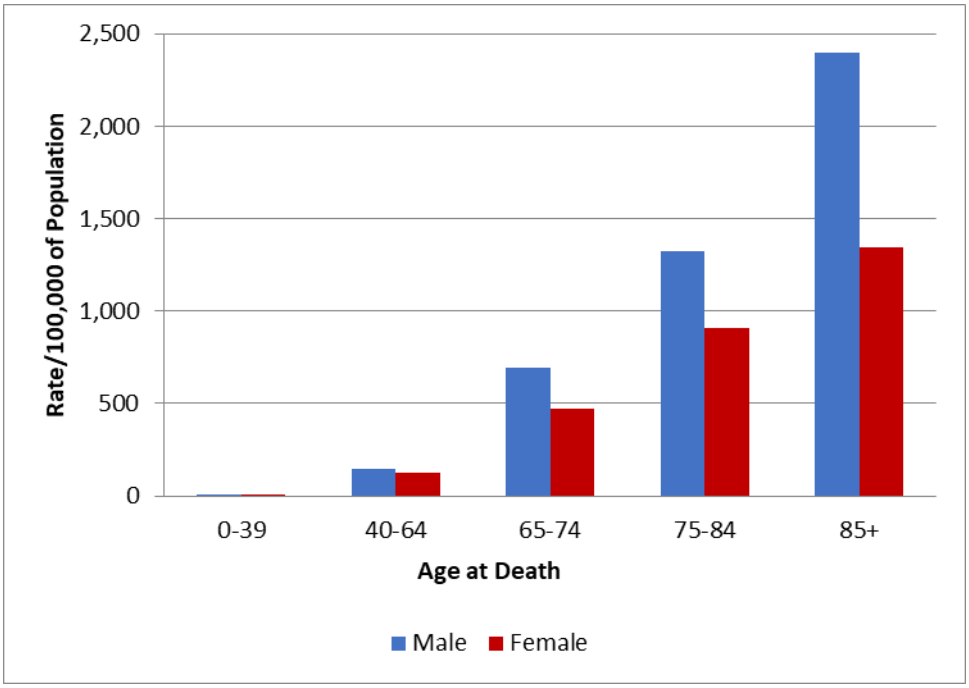
FIGURE 2-8: AGE-ADJUSTED ALL-SITE CANCER MORTALITY RATE TREND BY SEX AND RACE/ETHNICITY; DELAWARE, 2006-2020



Source (Delaware): Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, 2023.
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population and are calculated using modified U.S. Census populations available from NCI (https://seer.cancer.gov/popdata/).

- Comparing age-adjusted all-site cancer mortality rates by sex and race/ethnicity in Delaware between 2006 and 2020:
  - Mortality rates for all-site cancer decreased an average of 1.7% per year among non-Hispanic White males and decreased an average of 1.9% per year among non-Hispanic White females.
  - Mortality rates for all-site cancer decreased an average of 2.1% per year among non-Hispanic Black males and remained stable for non-Hispanic Black females.
  - The trend in mortality rates for all-site cancer was stable among both Hispanic males and Hispanic females.

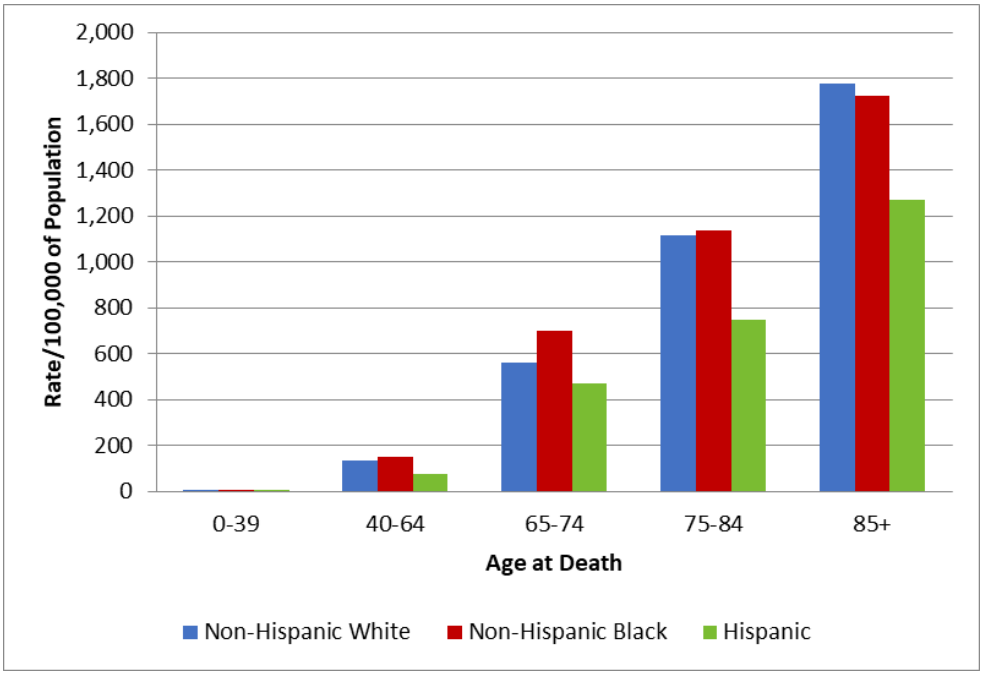
FIGURE 2-9: AGE-SPECIFIC ALL-SITE CANCER MORTALITY RATES BY SEX; DELAWARE, 2016-2020



Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, 2023.
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population and are calculated using modified U.S. Census populations available from NCI (https://seer.cancer.gov/popdata/).

- In 2016-2020, Delaware's all-site mortality rate was highest for both males and females 85 years of age and older.

FIGURE 2-10: AGE-SPECIFIC ALL-SITE CANCER MORTALITY RATES BY RACE/ETHNICITY; DELAWARE, 2016-2020



Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, 2023.
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population and are calculated using modified U.S. Census populations available from NCI (https://seer.cancer.gov/popdata/).

- Delaware's 2016-2020 all-site mortality rate was highest for non-Hispanic Whites, non-Hispanic Blacks, and Hispanics 85 years of age and older.

TABLE 2-6: AGE-SPECIFIC ALL-SITE CANCER MORTALITY RATES BY SEX AND RACE/ETHNICITY; DELAWARE, 2016-2020

Age at Death	Males			Females		
	Non-Hispanic White	Non-Hispanic Black	Hispanic	Non-Hispanic White	Non-Hispanic Black	Hispanic
0-39	6.1	---	---	5.5	---	---
40-64	149.2	147.6	92.2	121.8	148.6	55.6
65-74	669.6	880.4	609.9	463.3	569.1	340
75-84	1,360.9	1,334.2	1,082.7	917.2	999.2	472.7
85+	2,462.1	2,500.0	1,435.0	1,373.3	1,345.5	1,142.0

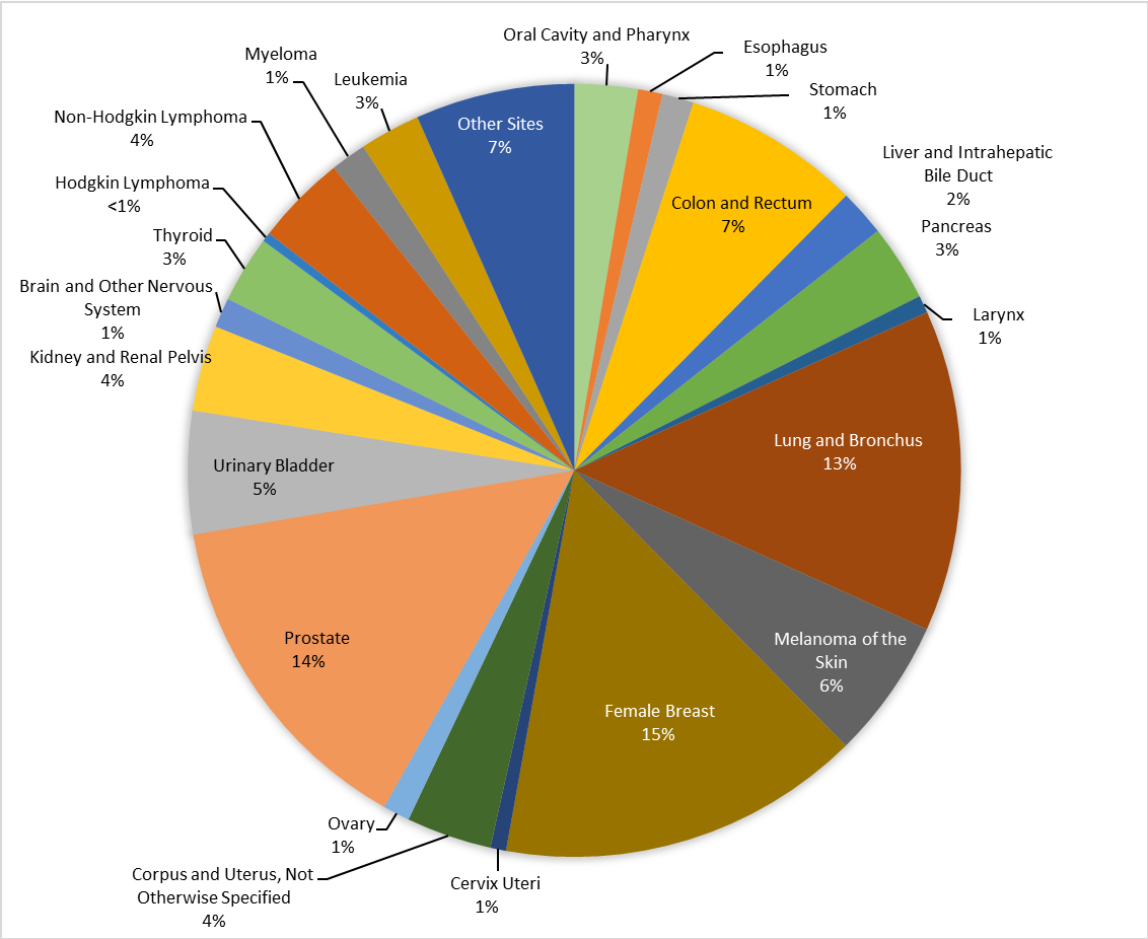
Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, 2023.
Rates are per 100,000 of population age-adjusted to the 2000 U.S. standard population and are calculated using modified U.S. Census populations available from NCI (https://seer.cancer.gov/popdata/).
---Rates based on 16 or fewer cases are not shown.

In Delaware from 2016-2020:

- The all-site mortality rate was highest for non-Hispanic White, non-Hispanic Black, and Hispanic males 85 years of age and older.
- The all-site mortality rate was highest for non-Hispanic White, non-Hispanic Black, and Hispanic females 85 years of age and older.
- Due to small numbers, mortality rates could not be calculated for certain groups.

INCIDENCE

FIGURE 4-1: PERCENT DISTRIBUTION OF CANCER CASES BY CANCER SITE, DELAWARE, 2016-2020



Source: Delaware Department of Social Services, Division of Public Health, Delaware Cancer Registry, 2023.

- In 2016-2020 in Delaware:
  - There were 29,805 new all-site cancer cases diagnosed, an average of 5,961 per year.
  - Female breast cancer accounted for 15% of all new cancer cases.
  - Lung and bronchus cancer accounted for 13% of all new cancer cases.
  - Prostate cancer accounted for 14% of all new cancer cases.
  - Colorectal cancer accounted for 7% of all new cancer cases.

TABLE 4-2: FIVE-YEAR AVERAGE AGE-ADJUSTED ALL-SITE AND SITE-SPECIFIC CANCER INCIDENCE RATES OVERALL; U.S. AND DELAWARE, 2016-2020

Cancer Site	DE Rate (overall)	U.S. Rate (overall)	DE Case Counts (overall)
All Sites	457.6*	442.2	29,805
Female Breast ♀	134.5	126.9	4,448
Prostate ♂	125.0	110.2	4,171
Lung and Bronchus	56.9*	54.2	3,962
Colon and Rectum	34.6	36.6	2,189
Uterus ♀	28.8	27.4	1,052
Melanoma of the Skin	27.1*	22.4	1,731
Urinary Bladder	22.5*	18.9	1,512
Non-Hodgkin Lymphoma	17.7	18.6	1,122
Kidney and Renal Pelvis	16.5	17.2	1,058
Thyroid	15.8*	13.3	827
Pancreas	13.9	13.2	940
Leukemia	12.2*	13.9	756
Oral Cavity and Pharynx	11.9	11.9	778
Ovary ♀	9.8	10.1	332
Liver/Intrahepatic Bile Duct	8.2	8.5	577
Cervix ♀	7.1	7.6	194
Myeloma	6.7	7.0	439
Brain/Nervous System	6.4	6.4	367
Stomach	6.0	6.2	388
Testis ♂	5.0	5.8	110
Esophagus	4.5	4.5	302
Larynx	3.2	3.0	216
Hodgkin Lymphoma	2.4	2.6	114

Rates are per 100,000 population and are age-adjusted to the 2000 U.S. standard population (19 age groups – Census P25–1130) **and are calculated using modified U.S. Census populations available from NCI (https://seer.cancer.gov/popdata/).** Incidence rates exclude in situ carcinomas except urinary bladder and exclude basal cell and squamous cell skin cancers. Incidence data were coded using the International Classification of Disease for Oncology (ICD-O) coding system.
Delaware cases include Delaware residents only at the time of diagnosis.
Sources: The Delaware and U.S. incidence rates are based on the Delaware Cancer Registry, Delaware Division of Public Health, 2022 submission and the NPCR and SEER Incidence - U.S. Cancer Statistics Public Use Database, 2022 submission (2001-2020), United States Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute. Released June 2023. Available at www.cdc.gov/cancer/uscs/public-use. Delaware rates are referenced as DE and U.S. references the United States.

*Statistically significantly higher than the U.S. rate.

- Comparing Delaware to the U.S. from 2016-2020:
    - Delaware (56.9 cases per 100,000 population) had a statistically significantly higher lung and bronchus cancer incidence rate compared to the U.S. (54.2 cases per 100,000 population).
    - Delaware (27.1 cases per 100,000 population) had a statistically significantly higher melanoma incidence rate compared to the U.S. (22.4 cases per 100,000 population).
    - Delaware (22.5 cases per 100,000 population) had a statistically significantly higher urinary bladder cancer incidence rate compared to the U.S. (18.9 cases per 100,000 population).
    - Delaware (15.8 cases per 100,000 population) had a statistically significantly higher thyroid cancer incidence rate compared to the U.S. (13.3 cases per 100,000 population).
    - Delaware (12.2 cases per 100,000 population) had a statistically significantly lower leukemia incidence rate compared to the U.S. (13.9 cases per 100,000 population).

TABLE 4-3: FIVE-YEAR AVERAGE AGE-ADJUSTED ALL-SITE AND SITE-SPECIFIC CANCER INCIDENCE RATES AND NUMBER OF CASES FOR MALES; U.S. AND DELAWARE, 2016-2020

Cancer Site	DE Rate (males)	U.S. Rate (males)	DE Case Counts (males)
All Sites	500.1*	480.4	15,289
Prostate	125.0*	110.2	4,171
Lung and Bronchus	62.4	61.3	1,950
Colon and Rectum	40.2	41.7	1,153
Urinary Bladder	38.4*	32.6	1,148
Melanoma of the Skin	35.0*	28.5	1,042
Kidney and Renal Pelvis	22.4	23.4	672
Non-Hodgkin Lymphoma	21.8	22.4	629
Oral Cavity and Pharynx	19.0	18.1	582
Leukemia	16.2	17.7	464
Pancreas	15.9	15.1	487
Liver/Intrahepatic Bile Duct	12.9	12.9	422
Stomach	8.3	8.3	243
Thyroid	8.1	7.0	215
Esophagus	7.7	7.8	237
Brain/Nervous System	7.6	7.5	201
Myeloma	7.5	8.5	223
Larynx	5.2	5.1	160
Testis	5.0	5.8	110
Hodgkin Lymphoma	2.7	2.9	66

Rates are per 100,000 population and are age-adjusted to the 2000 U.S. standard population (19 age groups – Census P25–1130) and are calculated using modified U.S. Census populations available from NCI (https://seer.cancer.gov/popdata/). Incidence rates exclude in situ carcinomas except urinary bladder and exclude basal cell and squamous cell skin cancers. Incidence data were coded using the International Classification of Disease for Oncology (ICD-O) coding system.
Delaware cases include Delaware residents only at the time of diagnosis.
Sources: The Delaware and U.S. incidence rates are based on the Delaware Cancer Registry, Delaware Division of Public Health, 2022 submission and the NPCR and SEER Incidence - U.S. Cancer Statistics Public Use Database, 2022 submission (2001-2020), United States Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute. Released June 2023. Available at www.cdc.gov/cancer/uscs/public-use. Delaware rates are referenced as DE and U.S. references the United States.

*Statistically significantly higher than the U.S. rate.

- Comparing Delaware males to U.S. males from 2016-2020:
    - The age-adjusted incidence rate for prostate cancer among Delaware males (125.0 cases per 100,000 population) was significantly higher compared to U.S. males (110.2 cases per 100,000 population).
    - Delaware males (35.0 cases per 100,000 population) had a statistically significantly higher melanoma age-adjusted incidence rate compared to U.S. males (28.5 cases per 100,000 population).
    - Delaware males (38.4 cases per 100,000 population) had a statistically significantly higher urinary bladder cancer incidence rate compared to U.S. males (32.6 cases per 100,000 population).

TABLE 4-4: FIVE-YEAR AVERAGE AGE-ADJUSTED ALL-SITE AND SITE-SPECIFIC CANCER INCIDENCE RATES AND NUMBER OF CASES FOR FEMALES; U.S., DELAWARE, 2016-2020

Cancer Site	DE Rate (females)	U.S. Rate (females)	DE Case Counts (females)
All Sites	426.9*	416.4	14,516
Female Breast	134.5*	126.9	4,448
Lung and Bronchus	52.7*	48.8	2,012
Colon and Rectum	29.8	32.1	1,036
Uterus	28.8	27.4	1,052
Thyroid	23.1*	19.4	612
Melanoma of the Skin	21.0*	18.0	689
Non-Hodgkin Lymphoma	14.3	15.4	493
Pancreas	12.3	11.7	453
Kidney and Renal Pelvis	11.5	11.8	386
Ovary	9.8	10.1	332
Urinary Bladder	9.8	8.1	364
Leukemia	9.1*	10.9	292
Cervix	7.1	7.6	194
Myeloma	6.0	5.7	216
Oral Cavity and Pharynx	5.7	6.5	196
Brain/Nervous System	5.5	5.3	166
Liver/Intrahepatic Bile Duct	4.2	4.8	155
Stomach	4.1	4.5	145
Hodgkin Lymphoma	2.1	2.3	48
Esophagus	1.8	1.7	65
Larynx	1.5	1.2	56

Rates are per 100,000 population and are age-adjusted to the 2000 U.S. standard population (19 age groups – Census P25–1130) and are calculated using modified U.S. Census populations available from NCI (https://seer.cancer.gov/popdata/). Incidence rates exclude in situ carcinomas except urinary bladder and exclude basal cell and squamous cell skin cancers. Incidence data were coded using the International Classification of Disease for Oncology (ICD-O) coding system.
Delaware cases include Delaware residents only at the time of diagnosis.
Sources: The Delaware and U.S. incidence rates are based on the Delaware Cancer Registry, Delaware Division of Public Health, 2022 submission and the NPCR and SEER Incidence - U.S. Cancer Statistics Public Use Database, 2022 submission (2001-2020), United States Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute. Released June 2023. Available at www.cdc.gov/cancer/uscs/public-use. Delaware rates are referenced as DE and U.S. references the United States.

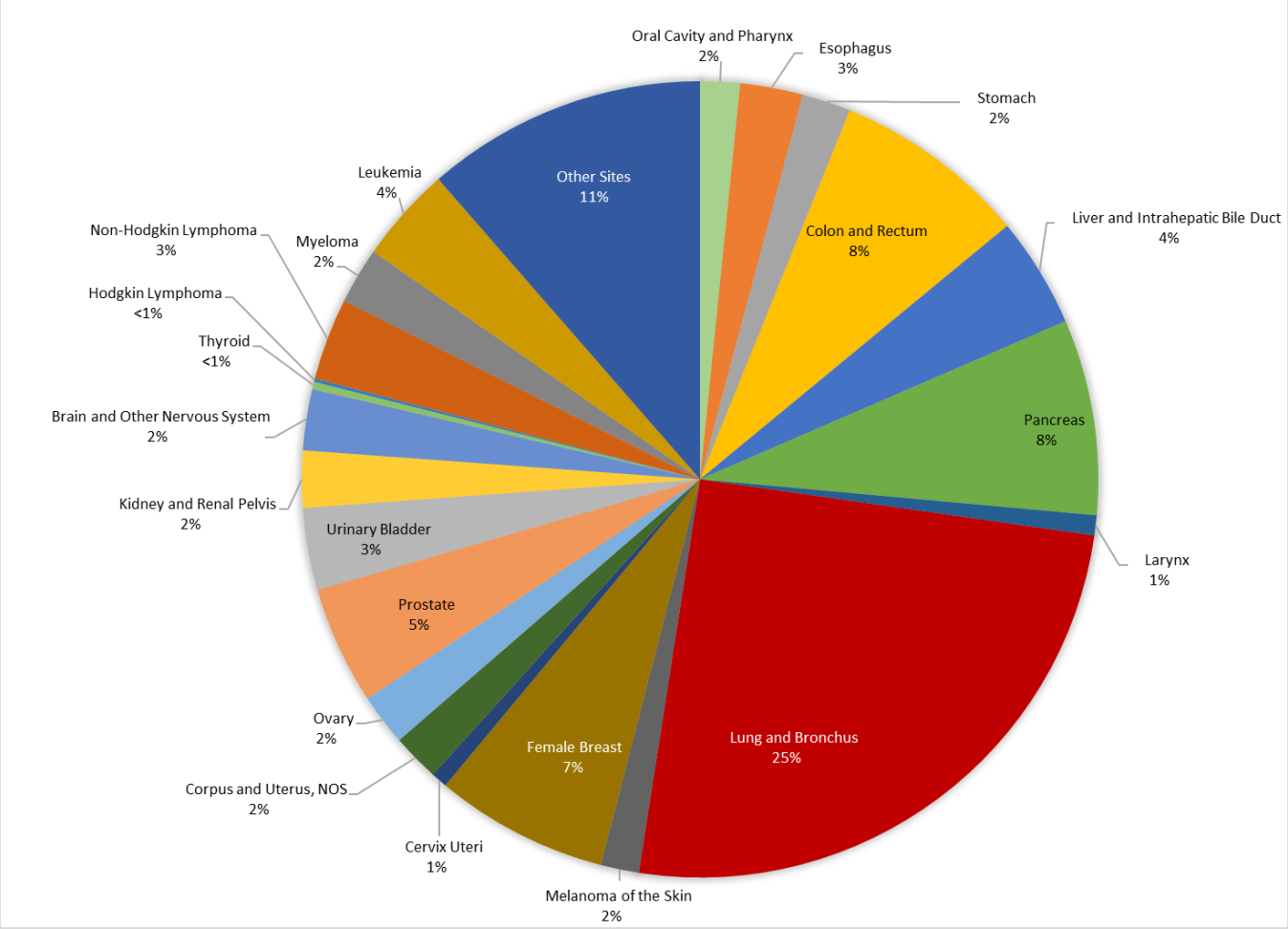
*Statistically significantly higher than the U.S. rate.

- Comparing Delaware females to U.S. females from 2016-2020:
    - Delaware females (134.5 cases per 100,000 population) had a statistically significantly higher breast cancer incidence rate compared to U.S. females (126.9 cases per 100,000 population).
    - Delaware females (52.7 cases per 100,000 population) had a statistically significantly higher lung and bronchus cancer incidence rate compared to U.S. females (48.8 cases per 100,000 population).
    - Delaware females (23.1 cases per 100,000 population) had a statistically significantly higher thyroid cancer incidence rate compared to U.S. females (19.4 cases per 100,000 population).
    - Delaware females (21.0 cases per 100,000 population) had a statistically significantly higher melanoma incidence rate compared to U.S. females (18.0 per 100,000 population).
    - Delaware females (9.1 cases per 100,000 population) had a statistically significantly lower leukemia incidence rate compared to U.S. females (10.9 cases per 100,000 population).

- Comparing Delaware females to Delaware males from 2016-2020:
    - Delaware males have a significantly higher age-adjusted incidence rate for oral cavity and pharynx cancer compared to Delaware females (19.0 cases per 100,000 population versus 5.7 cases per 100,000 population).
    - Delaware males have a significantly higher age-adjusted incidence rate for esophagus cancer compared to Delaware females (7.7 cases per 100,000 versus 1.8 cases per 100,000 population).
    - Delaware males have a significantly higher age-adjusted incidence rate for stomach cancer compared to Delaware females (8.3 cases per 100,000 versus 4.1 cases per 100,000 population).
    - Delaware males have a significantly higher age-adjusted incidence rate for colorectal cancer compared to Delaware females (40.2 cases per 100,000 population versus 29.8 cases per 100,000 population).
    - Delaware males have a significantly higher age-adjusted incidence rate for liver and intrahepatic bile duct cancer compared to Delaware females (12.9 cases per 100,000 population versus 4.2 cases per 100,000 population).
    - Delaware males have a significantly higher age-adjusted incidence rate for pancreatic cancer compared to Delaware females (15.9 cases per 100,000 population versus 12.3 cases per 100,000 population).
    - Delaware males have a significantly higher age-adjusted incidence rate for larynx cancer compared to Delaware females (5.2 cases per 100,000 population versus 1.5 cases per 100,000 population).
    - Delaware males have a significantly higher age-adjusted incidence rate for lung and bronchus cancer compared to Delaware females (62.4 cases per 100,000 population versus 52.7 cases per 100,000 population).
    - Delaware males have a significantly higher age-adjusted incidence rate for melanoma compared to Delaware females (35.0 cases per 100,000 population versus 21.0 cases per 100,000 population).
    - Delaware males have a significantly higher age-adjusted incidence rate for urinary bladder cancer compared to Delaware females (38.4 cases per 100,000 population versus 9.8 cases per 100,000 population).

- Delaware males have a significantly higher age-adjusted incidence rate for kidney and renal pelvis cancer compared to Delaware females (22.4 cases per 100,000 population versus 11.5 cases per 100,000 population).
- Delaware males have a significantly higher age-adjusted incidence rate for non-Hodgkin lymphoma compared to Delaware females (21.8 cases per 100,000 population versus 14.3 cases per 100,000 population).
- Delaware males have a significantly higher age-adjusted incidence rate for leukemia compared to Delaware females (16.2 cases per 100,000 population versus 9.1 cases per 100,000 population).
- Delaware males have a significantly lower age-adjusted incidence rate for thyroid cancer compared to Delaware females (8.1 cases per 100,000 population versus 23.1 cases per 100,000 population).

FIGURE 4-2: PERCENT DISTRIBUTION OF CANCER DEATHS BY CANCER SITE, DELAWARE, 2016-2020



Source: Delaware Department of Health and Social Services, Division of Public Health, Delaware Health Statistics Center, 2023.

- In 2016-2020 in Delaware:
  - There were 10,439 deaths from cancer, an average of 2,087 per year.
  - Lung and bronchus cancer accounted for 25% of all new cancer deaths.
  - Colorectal cancer and pancreatic cancer accounted for 8% of all new cancer deaths.
  - Female breast cancer accounted for 7% of all new cancer deaths.
  - Prostate cancer accounted for 5% of all new cancer deaths.

TABLE 4-5: FIVE-YEAR AVERAGE AGE-ADJUSTED ALL-SITE AND SITE-SPECIFIC CANCER MORTALITY RATES OVERALL; U.S. AND DELAWARE, 2016-2020

Cancer Site	DE Rate (Overall)	U.S. Rate (Overall)	DE Case Counts (Overall)
All Sites	156.8*	149.4	10,438
Lung and Bronchus	38.4*	35.0	2,631
Female Breast ♀	20.7	19.6	725
Prostate ♂	17.6	18.8	500
Colon and Rectum	12.7	13.1	823
Pancreas	12.2*	11.1	829
Liver/Intrahepatic Bile Duct	6.7	6.6	468
Leukemia	6.3	6.0	407
Ovary ♀	5.9	6.3	219
Uterus ♀	5.3	5.1	201
Urinary Bladder	5.3*	4.2	348
Non-Hodgkin Lymphoma	5.3	5.1	347
Brain/Nervous System	4.1	4.4	259
Esophagus	3.9	3.8	266
Myeloma	3.7*	3.1	239
Kidney and Renal Pelvis	3.6	3.5	241
Stomach	3.2	2.8	206
Melanoma of the Skin	2.5	2.1	168
Oral Cavity and Pharynx	2.5	2.5	162
Cervix ♀	2.2	2.2	69
Larynx	1.2*	0.9	85
Thyroid	0.5	0.5	31

Rates are per 100,000 population and are age-adjusted to the 2000 U.S. standard population (19 age groups – Census P25–1130) and are calculated using modified U.S. Census populations available from NCI (https://seer.cancer.gov/popdata/). Basal cell and squamous cell skin cancers were excluded. Mortality data were coded using the International Classification of Disease Tenth Revision (ICD-10) coding system.
Delaware deaths include Delaware residents only at the time of death.
Sources: The Delaware and the U.S. mortality rates are based on the Delaware Health Statistics, Delaware Division of Public Health, 2023 and the Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Mortality - All COD, Aggregated with State, Total U. S. (1990-2020), Delaware rates are referenced as DE and U.S. references the United States.

*Statistically significantly higher than the U.S. rate.

- Comparing Delaware to the U.S. from 2016-2020:
    - Delaware (38.4 deaths per 100,000 population) had a statistically significantly higher lung and bronchus cancer mortality rate compared to the U.S. (35.0 deaths per 100,000 population).
    - Delaware (12.2 deaths per 100,000 population) had a statistically significantly higher pancreatic cancer mortality rate compared to the U.S. (11.1 deaths per 100,000 population).
    - Delaware (5.3 deaths per 100,000 population) had a statistically significantly higher urinary bladder cancer mortality rate compared to the U.S. (4.2 deaths per 100,000 population).
    - Delaware (3.7 deaths per 100,000 population) had a statistically significantly higher myeloma cancer mortality rate compared to the U.S. (3.1 deaths per 100,000 population).
    - Delaware (1.2 deaths per 100,000 population) had a statistically significantly higher larynx mortality rate compared to the U.S. (0.9 deaths per 100,000 population).

TABLE 4-6: FIVE-YEAR AVERAGE AGE-ADJUSTED ALL-SITE AND SITE-SPECIFIC CANCER MORTALITY RATES AND NUMBER OF CASES FOR MALES; U.S. AND DELAWARE, 2016-2020

Cancer Site	DE Rate (Males)	U.S. Rate (Males)	DE Case Counts (Males)
All Sites	188.7*	177.4	5,582
Lung and Bronchus	45.6*	42.2	1,391
Prostate	17.6	18.8	500
Colon and Rectum	15.3	15.7	442
Pancreas	14.5	12.7	445
Liver/Intrahepatic Bile Duct	10.4	9.6	335
Urinary Bladder	9.3*	7.1	257
Leukemia	9.1	8.0	261
Non-Hodgkin Lymphoma	7.3	6.7	210
Esophagus	6.7	6.7	209
Brain/Nervous System	5.3	5.4	148
Kidney and Renal Pelvis	4.9	5.1	146
Stomach	4.8	3.8	136
Myeloma	4.5	3.9	126
Oral Cavity and Pharynx	4.3	3.9	135
Melanoma of the Skin	3.7	3.1	108
Larynx	1.9	1.6	60

Rates are per 100,000 population and are age-adjusted to the 2000 U.S. standard population (19 age groups – Census P25–1130) and are calculated using modified U.S. Census populations available from NCI (https://seer.cancer.gov/popdata/). Basal cell and squamous cell skin cancers were excluded.
Mortality data were coded using the International Classification of Disease Tenth Revision (ICD-10) coding system.
Delaware deaths include Delaware residents only at the time of death.
Sources: The Delaware and the U.S. mortality rates are based on the Delaware Health Statistics, Delaware Division of Public Health, 2023 and the Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Mortality - All COD, Aggregated with State, Total U. S. (1990-2020), Delaware rates are referenced as DE and U.S. references the United States.

*Statistically significantly higher than the U.S. rate.

- Comparing Delaware males to U.S. males from 2016-2020:
  - Delaware males (45.6 deaths per 100,000 population) had a statistically significantly higher lung and bronchus cancer mortality rate compared to U.S. males (42.2 deaths per 100,000 population).
  - Delaware males (9.3 deaths per 100,000 population) had a statistically significantly higher urinary bladder cancer mortality rate compared to U.S. males (7.1 deaths per 100,000 population).

TABLE 4-7: FIVE-YEAR AVERAGE AGE-ADJUSTED ALL-SITE AND SITE-SPECIFIC CANCER MORTALITY RATES AND NUMBER OF CASES FOR FEMALES; U.S. AND DELAWARE, 2016-2020

Cancer Site	DE Rate (Females)	U.S. Rate (Females)	DE Case Counts (Females)
All Sites	132.8	128.7	4,856
Lung and Bronchus	32.8*	29.3	1,240
Female Breast	20.7	19.6	725
Colon and Rectum	10.6	11.0	381
Pancreas	10.3	9.6	384
Ovary	5.9	6.3	219
Uterus	5.3	5.1	201
Leukemia	4.1	4.5	146
Non-Hodgkin Lymphoma	3.7	3.9	137
Liver/Intrahepatic Bile Duct	3.6	4.1	133
Brain/Nervous System	3.2	3.6	111
Myeloma	3.1	2.5	113
Urinary Bladder	2.5	2.0	91
Kidney and Renal Pelvis	2.5	2.2	95
Cervix	2.2	2.2	69
Stomach	2.0	2.1	70
Esophagus	1.6	1.4	57
Melanoma of the Skin	1.6	1.3	54
Oral Cavity and Pharynx	0.8	1.4	33
Larynx	0.7	0.3	25
Thyroid	0.6	0.5	22

Rates are per 100,000 population and are age-adjusted to the 2000 U.S. standard population (19 age groups – Census P25–1130) and are calculated using modified U.S. Census populations available from NCI (https://seer.cancer.gov/popdata/). Basal cell and squamous cell skin cancers were excluded. Mortality data were coded using the International Classification of Disease Tenth Revision (ICD-10) coding system.
Delaware deaths include Delaware residents only at the time of death.
Sources: The Delaware and the U.S. mortality rates are based on the Delaware Health Statistics, Delaware Division of Public Health, 2023 and the Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Mortality - All COD, Aggregated with State, Total U. S. (1990-2020), Delaware rates are referenced as DE and U.S. references the United States.

*Statistically significantly higher than the U.S. rate.

- Comparing Delaware females to U.S. females from 2016-2020:
    - Delaware females (32.8 deaths per 100,000 population) had a statistically significantly higher lung and bronchus cancer mortality rate compared to U.S. females (29.3 deaths per 100,000 population).

- Comparing Delaware females to Delaware males from 2016-2020:
    - Delaware males have a significantly higher age-adjusted mortality rate for lung and bronchus cancer compared to Delaware females (45.6 deaths per 100,000 population versus 32.8 deaths per 100,000 population).
    - Delaware males have a significantly higher age-adjusted mortality rate for colorectal cancer compared to Delaware females (15.3 deaths per 100,000 population versus 10.6 deaths per 100,000 population).
    - Delaware males have a significantly higher age-adjusted mortality rate for pancreatic cancer compared to Delaware females (14.5 deaths per 100,000 population versus 10.3 deaths per 100,000 population).
    - Delaware males have a significantly higher age-adjusted mortality rate for liver and intrahepatic bile duct cancer compared to Delaware females (10.4 deaths per 100,000 population versus 3.0 deaths per 100,000 population).
    - Delaware males have a significantly higher age-adjusted mortality rate for leukemia compared to Delaware females (9.1 deaths per 100,000 population versus 4.1 deaths per 100,000 population).
    - Delaware males have a significantly higher age-adjusted mortality rate for urinary bladder cancer compared to Delaware females (9.3 deaths per 100,000 population versus 2.5 deaths per 100,000 population).
    - Delaware males have a significantly higher age-adjusted mortality rate for non-Hodgkin lymphoma compared to Delaware females (7.3 deaths per 100,000 population versus 3.7 deaths per 100,000 population).
    - Delaware males have a significantly higher age-adjusted mortality rate for esophagus cancer compared to Delaware females (6.7 deaths per 100,000 versus 1.6 deaths per 100,000 population).
    - Delaware males have a significantly higher age-adjusted mortality rate for brain and nervous system cancer compared to Delaware females (5.3 deaths per 100,000 population versus 3.2 deaths per 100,000 population).
    - Delaware males have a significantly higher age-adjusted mortality rate for kidney and renal pelvis cancer compared to Delaware females (4.9 deaths per 100,000 population versus 2.5 deaths per 100,000 population).
    - Delaware males have a significantly higher age-adjusted mortality rate for stomach cancer compared to Delaware females (4.8 deaths per 100,000 population versus 2.0 deaths per 100,000 population).
    - Delaware males have a significantly higher age-adjusted mortality rate for oral cavity and pharynx cancer compared to Delaware females (4.3 deaths per 100,000 population versus 0.8 deaths per 100,000 population).
    - Delaware males have a significantly higher age-adjusted mortality rate for melanoma compared to Delaware females (3.7 deaths per 100,000 population versus 1.6 deaths per 100,000 population).
    - Delaware males have a significantly higher age-adjusted mortality rate for larynx cancer compared to Delaware females (1.9 deaths per 100,000 population versus 0.7 deaths per 100,000 population).

APPENDIX A: DATA SOURCES AND METHODOLOGY

CANCER INCIDENCE DATA

DELAWARE CANCER REGISTRY

This report covers data on cancer cases diagnosed among Delawareans from January 1, 2016, to December 31, 2020, that were reported to the Delaware Cancer Registry (DCR) by November 2022. Trends in incidence rates are based on cancers diagnosed from January 1, 2006 to December 31, 2019. The COVID-19 pandemic resulted in delays and reductions in cancer screening and diagnosis, which subsequently led to a decline in 2020 incidence counts and rates that was considered an anomaly. Inclusion of 2020 rates would bias the estimates of trends over time and therefore 2020 rates were not included in trend analysis.[14]

During 2016-2020, there were 29,805 cancer cases diagnosed among Delawareans, which includes individuals with cancers diagnosed at more than one site (known as multiple primaries). With the exception of urinary bladder cancer, only malignant tumors are included in the analyses. *In situ* urinary bladder cancer cases are included because, based on language used by pathologists, it is difficult to distinguish them from malignant cancers.

The International Classification of Diseases for Oncology, Second Edition (ICD-O-2), describes the topography (primary anatomic site) and morphology (histology) for cancers reported from 1988 through 2000. Cancers diagnosed from 2001 through the present are coded using the International Classification of Diseases for Oncology, Third Edition (ICD-O-3)[15]. Relevant codes for this report are in Appendix B. The topography code defines both the site of the tumor and the type of cancer. The first four digits of the morphology code define the histology of the cancer and the fifth digit indicates whether the cancer is malignant, benign, *in situ*, or uncertain. Consistent with the CDC's publication of the *U.S. Cancer Statistics*, Kaposi's sarcoma and mesothelioma are considered separate sites based on distinct histology codes.

UNITED STATES CANCER STATISTICS (USCS)

U.S. incidence data were obtained from United States Cancer Statistics (USCS) which consists of data from cancer registries participating in the Centers for Disease Control and Prevention's (CDC's) National Program of Cancer Registries (NPCR) and the National Cancer Institute's (NCI's) Surveillance, Epidemiology, and End Results (SEER) Program. Incidence data are included from selected cancer registries meeting U.S. Cancer Statistics data quality criteria covering 99% of the U.S. population.

Historically, Delaware's cancer incidence rates were compared to cancer incidence rates calculated using data from the SEER program, which began in 1973 with data collected from nine SEER program cancer registries (SEER-9). Over time, the number of SEER program registries expanded. In 2009, the Delaware Department of Health and Social Services (DHSS), Division of Public Health (DPH) and the Delaware Cancer Consortium (DCC) began using cancer incidence rates based on 18 population-based registries as a comparison for Delaware's cancer incidence rates. Starting with the "Cancer Incidence and Mortality in Delaware, 2015-2019" report, USCS data was used to align with national statistics presented by national standard-setters that includes the most comprehensive data covering a majority of the U.S. population.

[14] National Cancer Institute, Surveillance, Epidemiology, and End Results Program: Impact of COVID on 2020 SEER Cancer Incidence Data, https://seer.cancer.gov/data/covid-impact.html

[15] Fritz A, Jack A, Parkin DM, Percy C, Shanmugarathan, Sobin L, Whelan S (eds). International Classification of Diseases for Oncology, Third Edition (ICD-O-3). World Health Organization, Geneva.

CANCER MORTALITY DATA

DELAWARE HEALTH STATISTICS CENTER

Mortality data are provided by the Delaware Health Statistics Center (DHSC) for all death certificates filed in Delaware from 2006 through 2020. Trend analyses for cancer mortality are based on deaths that occurred from January 1, 2006, to December 31, 2020.

For deaths that occurred from 1999 to the present, the International Classification of Diseases, Tenth Edition (ICD-10) is used to code cause of death. To determine the underlying cause of death, the sequence of events leading to the individual's death are recorded on the death certificate and run through the Automated Classification of Medical Entities (ACME) software used by the National Center for Health Statistics (NCHS). This program uses a series of rules and hierarchies of events to select the most appropriate underlying cause of death.

NATIONAL CENTER FOR HEALTH STATISTICS

U.S. mortality data were obtained from the NCHS. U.S. mortality data are compiled from all death certificates filed in the 50 states and the District of Columbia from 1980 through 2020. Cause of death was coded by NCHS in accordance with World Health Organization regulations that stipulate that cancer deaths be coded using the most current revision of the International Classification of Diseases. As in Delaware, deaths that occurred prior to 1999 in the U.S. are coded using ICD-9 and beginning with 1999 deaths are coded using ICD-10. These U.S. mortality data were accessed through SEER*Stat[16].

POPULATION ESTIMATES, 2016-2020

Cancer incidence and mortality rates for the U.S. are calculated using population totals estimated by the U.S. Census. Delaware rates are based on population estimates released by the U.S. Census Bureau. Population files are obtained from the NCI SEER website.[17] When calculating age-adjusted mortality rates, the CDC utilizes SEER population estimates derived from the U.S. Census for the denominator[18]. To remain consistent with national reporting of cancer statistics, DPH utilizes U.S. Census data from SEER.[19]

RISK FACTORS AND EARLY DETECTION

The Behavioral Risk Factor Survey (BRFS) is the world's largest ongoing telephone health survey tracking health conditions and risk behaviors in the United States yearly since 1984. Currently, data are collected in all 50 states and four territories. The survey was developed to monitor the statewide prevalence of behavioral risk factors influencing premature morbidity and mortality. The BRFS includes a core set of questions developed by the CDC and is administered to adults 18 years of age and older. Delaware's BRFS is a collaborative effort between DPH and the CDC. BRFS questions target lifestyle behaviors (including tobacco use, fruit and vegetable consumption, exercise, and weight control); cancer screening practices; health status; and health care access and use[20]. Technological and cultural changes are posing challenges to survey research. One of the most significant challenges is the rapid increase in households where telephone service

[16] Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Mortality - All COD, Aggregated Total U.S. (1990-2020) <Katrina/Rita Population Adjustment>, National Cancer Institute, DCCPS, Surveillance Research Program, released June 2022. Underlying mortality data provided by NCHS (www.cdc.gov/nchs).

[17] National Cancer Institute. (n.d.). *Download U.S. population data - seer population data*. Surveillance, Epidemiology, and End Results Program. Retrieved August 23, 2023, from https://seer.cancer.gov/popdata/download.html

[18] United States Cancer Statistics: Data Visualizations, Footnotes, Centers for Disease Control and Prevention

[19] United States County Population Data, 1969-2020, National Cancer Institute, cancer.gov

[20] Behavioral Risk Factor Surveillance System, http://www.cdc.gov/BRFS/

is provided primarily, or only, via cell phone service. These "cell phone" households are, at least currently, more common among young adults and minority populations.[21]

Originally, the BRFS survey was administered by a random-digit-dial telephone survey. Starting with reporting 2011 data, the BRFS became a "multi-mode survey," using several modes of data collection — including landline telephone interviews, cell phone interviews, and online follow-up surveys for some respondents who did not want to respond by phone. Also, the BRFS uses a new method for weighting data, called "raking," which more accurately reflects the actual population of each state[22]. Because cell phones are quickly replacing landline phones, it was difficult to obtain a true representative sample of some population subgroups during the late 2000s. The response rate problems likely resulted in less accurate prevalence estimates for some behaviors or conditions more prevalent in populations who primarily used cell phones. For example, the prevalence of cigarette smoking, known to be more prevalent among young adults, may have been under-estimated for several years.[23]

The data in Appendix D and E relate to cancer screening and risk factor prevalence among Delawareans. Data on breast, cervical, colorectal, and prostate cancer screening patterns among Delawareans are provided in relevant cancer site chapters earlier in this document. Data on overweight and obesity, physical activity, and consumption of dietary fruits and vegetables are provided in Appendix E[24]. Data on known and suspected cancer risk factors and screening recommendations are in Appendices D and E. The 2020 BRFS data include screening compliance data (Appendix D) and risk factor data (Appendix E).

[21] Delaware Behavioral Risk Factor Survey-Changing to meet new challenges, https://www.dhss.delaware.gov/dhss/dph/dpc/brfs_changes2011.html
[22] Behavioral Risk Factor Surveillance System (BRFS) Fact Sheet: Raking– Changing Weighting Methodology, http://www.dhss.delaware.gov/dph/dpc/files/rakingweights_info.pdf
[23] Delaware Behavioral Risk Factor Survey-Changing to meet new challenges, https://www.dhss.delaware.gov/dhss/dph/dpc/brfs_changes2011.html
[24] Delaware Behavioral Risk Factor Survey – Measuring Behaviors that Affect Health, http://www.dhss.delaware.gov/dph/dpc/brfsurveys.html

AGE-ADJUSTMENT OF INCIDENCE AND MORTALITY RATES

The age distribution of a population is an important determinant of the burden of cancer. Because cancer incidence and mortality increase with age, crude rates cannot be used for comparisons of cancer statistics between sexes, racial or ethnic groups, or geographic entities across different time spans.

Age adjustment is useful when comparing two or more populations with different age distributions at one point in time or one population at two or more points in time[25]. To calculate an age-adjusted incidence rate, the crude incidence rate for each of 18 five-year age groups is multiplied by a fixed population weight for that specific age group using the appropriate 2000 U.S. Standard Population (Table A-1)[26]. Individual age-specific rates are then summed to obtain the overall age-adjusted rate.

TABLE A-1: U.S. STANDARD YEAR 2000 POPULATION WEIGHTS, BY AGE GROUP

Age Group	Population Weight	Age Group	Population Weight
0-4	0.0691	**45-49**	0.0721
5-9	0.0725	**50-54**	0.0627
10-14	0.0730	**55-59**	0.0485
15-19	0.0722	**60-64**	0.0388
20-24	0.0665	**65-69**	0.0343
25-29	0.0645	**70-74**	0.0318
30-34	0.0710	**75-79**	0.0270
35-39	0.0808	**80-84**	0.0178
40-44	0.0819	**85+**	0.0155

Source: U.S. Census 2000, accessed from SEER, http://seer.cancer.gov/stdpopulations/19ages.proportions.html.

The formula for an age-adjusted rate can be presented as follows:

$$\textit{Age-Adjusted Rate} = \textit{sum}\ (w_i \times ((c_i/n_i) \times 100{,}000))$$

- c_i is the number of new cases or deaths in the *i* age group
- n_i is the population estimate for the *i* age group
- w_i is the proportion of the standard population in the *i* age group

All rates are expressed per 100,000 of the population.

TRENDS OVER TIME: JOINPOINT METHODOLOGY

For this report, trend analysis was calculated using Joinpoint statistical software available through the NCI.[27] Briefly, trend data (e.g., cancer incidence and mortality rates), are input into the software and the software fits the simplest joinpoint model that is identified from the data. The model provides information about significant changes in the trend across the years and calculates the annual percent change.

[25] Anderson RN, Rosenberg HM. Report of the second workshop on age adjustment. National Center for Health Statistics. Vital Health Stat 4(30). 1998.
[26] Klein RJ, Schoenborn CA. Age Adjustment Using the 2000 Projected U.S. Population. Healthy People statistical notes, no. 20, http://www.cdc.gov/nchs/data/statnt/statnt20.pdf
[27] https://surveillance.cancer.gov/joinpoint/

RACE/ETHNICITY- AND SEX-SPECIFIC INCIDENCE AND MORTALITY RATES

Race/ethnicity- and sex-specific incidence and mortality rates are calculated to assess how cancer patterns differed across subgroups within the state. These rates are calculated by dividing the number of cases or deaths that occurred in each race/ethnic and/or sex group by the total population in the corresponding race/ethnic and/or sex group over the same time period. As with other rates, these rates were adjusted to the 2000 U.S. standard population and expressed per 100,000 of the population.

CONFIDENCE INTERVALS

Age-adjusted incidence and mortality rates are subject to chance variation, particularly when they are based on a small number of cancer cases or deaths occurring over a limited time period or in a limited geographic area. Aggregating several years of data provides more reliable estimates of incidence and mortality in these situations. The level of uncertainty associated with incidence and mortality rates is estimated by the 95% confidence interval.

When incidence rates are based on more than 100 cases, lower and upper limits of the 95% confidence intervals for an age-adjusted (AA) incidence or mortality rate are calculated using SEER*Stat[28] by methodology shown here:[29]

$$\text{Lower Confidence Limit} = \text{AA Rate} - 1.96\left[\frac{\text{AA Rate}}{\sqrt{\#\text{ Cases}}}\right]$$

$$\text{Upper Confidence Limit} = \text{AA Rate} + 1.96\left[\frac{\text{AA Rate}}{\sqrt{\#\text{ Cases}}}\right]$$

where AA Rate is the age-adjusted incidence or mortality rate.

When an incidence or mortality rate is based on fewer than 100 cases or deaths, the 95% confidence intervals are calculated using the following formulas:

$$\text{Lower Confidence Limit (LCL)} = \text{AA Rate} \times L$$

$$\text{Upper Confidence Limit (UCL)} = \text{AA Rate} \times U$$

where L and U are values published by the NCHS for the specific purpose of calculating 95% confidence intervals for rates based on fewer than 100 cases[30].

LIMITATIONS OF CONFIDENCE INTERVALS

Confidence intervals are part of the standard calculations provided within SEER*Stat. While confidence intervals can be helpful to explore potential differences between populations, identifying statistically significant differences by overlapping confidence intervals alone is subject to Type I and Type II errors more often than standard hypothesis testing. Therefore, for the purpose of this report, confidence intervals are calculated but not reported within the report. For comparison of rates between two populations, an incidence rate ratio is calculated with corresponding p-value. Significance has been set to <0.05, an industry standard. The IRR is not reported but used to determine the language used to describe differences. Statements that include “statistically significant,” “significantly higher,” or “significantly lower” used the confidence interval method and were confirmed by a statistically significant incidence rate ratio.

[28] Surveillance, Epidemiology and End Results (SEER) Program, National Cancer Institute. SEER*Stat Software, Version 8.3.5, http://seer.cancer.gov/seerstat/index.html

[29] Tiwari RC, Clegg LX, Zou Z. Efficient interval estimation for age-adjusted cancer rates. Stat Methods Med Res 2006;15(6):547-69.

[30] Martin JA, Hamilton BE, Ventura SJ, Menacker F, Park MM, Sutton PD. Births: Final data for 2001. National vital statistics reports; vol. 51 no. 2. Hyattsville, Maryland: National Center for Health Statistics, 2002.

DATA RELEASE STANDARDS

For this report, cancer frequencies and rates are released according to CDC's United States Cancer Statistics suppression of rates and counts guidance.[31] Incidence and mortality frequencies of fewer than 16 are not presented and age-adjusted incidence and mortality rates based on 16 or fewer cases or deaths are not calculated. This DPH policy helps protect patient privacy and confidentiality[32,33]. Furthermore, a cancer rate based on a very small number of cases is inherently unstable and cannot be reliably interpreted.

DEFINITION OF RACE/ETHNICITY

In this report, the race/ethnicity category is defined as follows:

1. Non-Hispanic White – cases who are reported to have White race and not of Hispanic/Latino ethnicity.
2. Non-Hispanic Black – cases who are reported to have Black race and not of Hispanic/Latino ethnicity.
3. Hispanic – cases who are reported to be of Hispanic/Latino ethnicity regardless of race.

NATIONAL CANCER RANKING

State cancer rank information was retrieved from the National Cancer Institute's CI*Rank website which provides ranked age-adjusted cancer incidence and mortality rates by state, county and special region.[34][1] The data sources for the rankings that cover the 2016-2020 period are U.S. Mortality Data 1999-2020 from the National Center for Health Statistics and U.S. Cancer Incidence 1995-2020 data from the North American Association of Central Cancer Registries (NAACCR) CiNA Analytic File, 1995-2020.

It should be noted that the incidence data for some years are incomplete for some states and some states are excluded. Specifically, for 2016-2020 rankings used in the current report, data were not available for all or at least part of the period for the following states: Arkansas, Colorado, Florida, Indiana, Kansas, Maryland, Minnesota, Missouri, Nevada, and Vermont. As a result, cancer incidence state rankings do not include these states and the rankings are only among the states that are included (i.e., the remaining states plus Washington, DC for a total of 41 ranking spots). The cancer mortality state rankings do include all states plus Washington, DC. [35]

[31] Centers for Disease Control and Prevention. (2022, June 6). *Statistical methods: Suppression of rates and counts*. United States Cancer Statistics (USCS). Retrieved August 18, 2022, from https://www.cdc.gov/cancer/uscs/technical_notes/stat_methods/suppression.htm
[32] Coughlin SS, Clutter GG, Hutton M. Ethics in Cancer Registries. *Journal of Cancer Registry Management, 2:* 5-10, 1999.
[33] McLaughlin CC. Confidentiality protection in publicly released central registry data. *Journal of Cancer Registry Management, 2:* 84-88, 2002.
[34] CI*Rank: Ranked Incidence and Mortality Rates by State, County, and Special Region from https://surveillance.cancer.gov/cirank/

APPENDIX B: PRIMARY CANCER SITE DEFINITIONS

TABLE B-1: PRIMARY CANCER SITE DEFINITIONS

Cancer Site Group	ICD-O-3 Site	ICD-O-3 Histology (Type)
Oral Cavity and Pharynx		
Lip	C000-C009	excluding 9050-9055, 9140, 9590-9992
Tongue	C019-C029	excluding 9050-9055, 9140, 9590-9992
Salivary Gland	C079-C089	excluding 9050-9055, 9140, 9590-9992
Floor of Mouth	C040-C049	excluding 9050-9055, 9140, 9590-9992
Gum and Other Mouth	C030-C039, C050-C059, C060-C069	excluding 9050-9055, 9140, 9590-9992
Nasopharynx	C110-C119	excluding 9050-9055, 9140, 9590-9992
Tonsil	C090-C099	excluding 9050-9055, 9140, 9590-9992
Oropharynx	C100-C109	excluding 9050-9055, 9140, 9590-9992
Hypopharynx	C129, C130-C139	excluding 9050-9055, 9140, 9590-9992
Other Oral Cavity and Pharynx	C140, C142, C148	excluding 9050-9055, 9140, 9590-9992
Esophagus	C150-C159	excluding 9050-9055, 9140, 9590-9992
Stomach	C160-C169	excluding 9050-9055, 9140, 9590-9992
Colon and Rectum	C180–C189, C260, C199, C209	excluding 9050–9055, 9140, 9590-9992
Liver and Intrahepatic Bile Duct	C220-C221	excluding 9050-9055, 9140, 9590-9992
Pancreas	C250-C259	excluding 9050-9055, 9140, 9590-9992
Larynx	C320-C329	excluding 9050-9055, 9140, 9590-9992
Lung and Bronchus	C340-C349	excluding 9050-9055, 9140, 9590-9992
Melanoma of the Skin	C440-C449	8720-8790
Breast	C500-C509	excluding 9050-9055, 9140, 9590-9992
Cervix Uteri	C530-C539	excluding 9050-9055, 9140, 9590-9992
Corpus and Uterus, Not Otherwise Specified	C540-C549, C559	excluding 9050-9055, 9140, 9590-9992
Ovary	C569	excluding 9050-9055, 9140, 9590-9992
Prostate	C619	excluding 9050-9055, 9140, 9590-9992
Testis	C620-C629	excluding 9050-9055, 9140, 9590-9992
Urinary Bladder	C670-C679	excluding 9050-9055, 9140, 9590-9992
Kidney and Renal Pelvis	C649, C659	excluding 9050-9055, 9140, 9590-9992
Brain and Other Nervous System		
Brain	C710-C719	excluding 9050-9055, 9140, 9530-9539, 9590-9992
Cranial Nerves Other Nervous System	C710-C719	9530-9539
	C700-C709, C720-C729	excluding 9050-9055, 9140, 9590-9992
Thyroid	C739	excluding 9050-9055, 9140, 9590-9992
Hodgkin Lymphoma		

Cancer Site Group	ICD-O-3 Site	ICD-O-3 Histology (Type)
Hodgkin – Nodal	C024, C098-C099, C111, C142, C379, C422, C770-C779	9650-9667
Hodgkin – Extranodal	All other sites	9650-9667
Non-Hodgkin Lymphoma		
NHL – Nodal	C024, C098, C099, C111, C142, C379, C422, C770-C779	9590-9597, 9670-9671, 9673, 9675, 9678-9680, 9684, 9687-9691, 9695, 9698-9702, 9705, 9708-9709, 9712, 9714-9719, 9724-9729, 9735, 9737-9738, 9811-9818, 9823, 9827, 9837
NHL – Extranodal	All sites except C024, C098-C099, C111, C142, C379, C422, C770-C779	9590-9597, 9670-9671, 9673, 9675, 9678-9680, 9684, 9687, 9688, 9689-9691, 9695, 9698-9702, 9705, 9708-9709, 9712, 9714-9719, 9724-9729, 9735, 9737, 9738
	All sites except C024, C098-C099, C111, C142, C379, C420-C422, C424, C770-C779	9811-9818, 9823, 9827, 9837
Myeloma		9731-9732, 9734
Leukemia		
Lymphocytic Leukemia		
Acute Lymphocytic Leukemia		9826, 9835-9836
	C420, C421, C424	9811-9818, 9837
Chronic Lymphocytic Leukemia	C420, C421, C424	9823
Other Lymphocytic Leukemia		9820, 9832-9834, 9940
Myeloid and Monocytic Leukemia		
Acute Myeloid Leukemia		9840, 9861, 9865-9867, 9869, 9871-9874, 9895-9897, 9898, 9910-9911, 9920
Acute Monocytic Leukemia		9891
Chronic Myeloid Leukemia		9863, 9875-9876, 9945-9946
Other Myeloid/Monocytic Leukemia		9860, 9930
Other Leukemia		
Other Acute Leukemia		9801, 9805-9809, 9931
Aleukemic, subleukemic and Not Otherwise Specified		9733, 9742, 9800, 9831, 9870, 9948, 9963-9964
	C420, C421, C424	9827

Source: National Cancer Institute, Surveillance, Epidemiology, and End Results (SEER) Program, *Site Recode ICD-O-3/WHO 2008 Definition* http://seer.cancer.gov/siterecode/icdo3_dwhoheme/index.html.

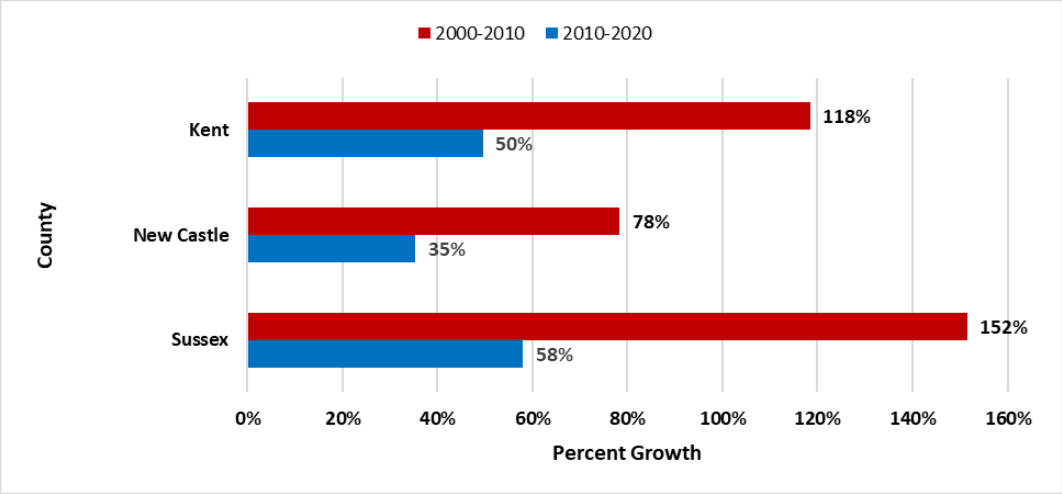
APPENDIX C: HISPANIC ETHNICITY

The U.S. Census Bureau defines "Hispanic or Latino" as "a person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin regardless of race."[36] According to the Census Bureau, in 2000, persons of Hispanic ethnicity comprised 5% of Delaware's population. By 2010, Delaware's Hispanic population increased to 8%. In the 2020 U.S. Census, persons of Hispanic origin comprised 11% of Delaware's population.

By county, the Hispanic prevalence grew to 4% in 2000, 9% in 2010, and 11% in 2020 in Sussex County. New Castle County had a similar prevalence of 5% in 2000, 9% in 2010, and 11% in 2020. Among Kent County residents, the Hispanic population grew to 3% in 2000, 6% in 2010, and 8% in 2020.

Figure C-1 shows the percentage change of the Hispanic population by county and decade in Delaware. From 2000 to 2010, the Hispanic population grew by 118% in Kent County, 78% in New Castle County, and 152% in Sussex County. In the following decade, from 2010 to 2020, the Hispanic population grew by 50% in Kent County, 35% in New Castle County, and 58% in Sussex County.

FIGURE C-1: PERCENTAGE OF CHANGES IN HISPANIC POPULATION BY COUNTY AND DECADE, DELAWARE, 2000-2010 AND 2010-2020



Source: U.S. Census Bureau 2020, https://data.census.gov/

Specific issues that suggest that Hispanic cancer rates could be subject to misinterpretation are discussed below:

- **Uncertain estimate of Delaware's Hispanic population —** Estimates of Delaware's population are derived from the census performed every 10 years by the U.S. Census Bureau and a final adjustment based on projections from the U.S. Census Bureau as to the overall rate of growth for the Hispanic population in both the state and the nation.
- **Inaccurate recording of Hispanic ethnicity on death certificates —** Race and Hispanic origin are treated as distinct categories and reported separately on death certificates and to the Delaware Cancer Registry, in accordance with guidelines from the federal Office of Management and Budget. However, it is possible that Hispanic race is under-reported both in the cancer registry and on death certificates.
- **Hispanic identification in the Delaware Cancer Registry data —** The North American Association of Central Cancer Registries (NAACCR) convened an expert panel in 2001 to develop a best practices

[36] Grieco, EM, Cassidy RC. (2001-03). "Overview of Race and Hispanic Origin: Census 2000 Brief" U.S. Census Bureau. Accessed May 26, 2011.

approach to Hispanic identification. In the resulting approach to enhance Hispanic identification, the NAACCR Hispanic Identification Algorithm (NHIA) was computerized and released for use by central cancer registries in 2003. In this report, NHIA is used to identify Delawareans of Hispanic origin. To minimize misclassification, the expert panel continues to evaluate the NHIA while considering the possibility of the under- or over-estimation of Hispanic cancer incidence.

- **Small number of cases or deaths and small population sizes —** An incidence or mortality rate is an estimate, and the reliability of estimates can be measured by calculating a confidence interval. A narrow confidence interval suggests that the rate is a good estimate; a wide confidence interval suggests that the rate should be interpreted with caution. If the confidence intervals of two rates do not overlap, the rates are considered to be statistically different. Both the size of the numerator (the number of cases or deaths) and the size of the denominator (the population) determine the width of the confidence interval. Typically, researchers report 95% confidence intervals. When constructed properly, a 95% confidence interval includes the true cancer rate 95% of the time.

APPENDIX D: EARLY DETECTION

FEMALE BREAST CANCER SCREENING RECOMMENDATIONS

A screening mammogram (x-ray of the breast) is used to detect breast disease in females who appear to have no breast problems. For early breast cancer detection in females without breast symptoms, the Delaware Cancer Consortium (DCC) recommends that:[37]

- Females 40 years of age and older should get a mammogram and clinical breast exam annually.
- Females 25 years of age and older should get a clinical breast exam annually.

Also, as females should know how their breasts normally look and feel, they should report any breast change promptly to their health care provider. The American Cancer Society suggests females are aware how her breast feel and look. If changes occur, these changes should be reported to her health care provider[37]. Females at increased risk for breast cancer should discuss with their health care provider the benefits and limitations of beginning mammograms when they are younger, having additional tests, and/or having more frequent exams.

FEMALE BREAST CANCER SCREENING IN DELAWARE

The Behavioral Risk Factor Survey (BRFS) has collected yearly mammogram use data through 2000; after 2000, mammogram use data are collected biennially. The BRFS asks a female respondent about her receiving a mammogram during the previous two years (as opposed to the annual mammogram screening schedule recommended by the DCC) to account for minor variations in scheduling that may cause a woman to miss the one-year threshold (e.g., two mammogram screening appointments 14 months apart).

Data from the 2020 BRFS provides information on breast cancer screening among Delaware females:

- Of Delaware females 40 years of age and older, 73% reported having a mammogram within the previous two years, compared to a national median of 72%. Delaware females ranked 17th highest nationally for this response.
- In Delaware, the percentage of non-Hispanic Caucasian females 40 years of age and older who reported having a mammogram in the past two years was slightly lower compared to non-Hispanic African American females. The difference was not significantly different (74% versus 76%, respectively).
- Delaware females 40 years of age and older in the two highest income categories had the highest percentages of mammography use (79% for females with an annual household income between $35,000 to $49,999 and 75% for females with an annual income of $50,000 or more).
- Delaware females (40 years of age and older) who were college graduates (78%) had a higher prevalence of having had a mammogram in the past two years, compared to Delaware females who had less than a high school diploma (53%); this difference was statistically significant.

CERVICAL CANCER SCREENING RECOMMENDATIONS

In 2020, the American Cancer Society (ACS) updated their recommendations for cervical cancer screening. Their recommendations are that "individuals with a cervix initiate cervical cancer screening at age 25 and undergo primary HPV testing every 5 years through age 65 (preferred). If primary HPV testing is not available,

[37] American Cancer Society. (2019, January 24). *Breast cancer screening guidelines faqs: FAQ breast cancer*. Breast Cancer Screening Guidelines FAQs | FAQ Breast Cancer | American Cancer Society. https://www.cancer.org/cancer/types/breast-cancer/frequently-asked-questions-about-the-american-cancer-society-new-breast-cancer-screening-guideline.html

individuals aged 25-65 years should be screened with co-testing (HPV testing in combination with cytology) every 5 years or cytology alone every 3 years (acceptable) (*strong recommendation*)"*. As well, "The ACS recommends that individuals with a cervix who are older than age 65, who have no history of cervical intraepithelial neoplasia grade 2 or a more severe diagnosis within the past 25 years, and who have documented adequate negative prior screening in the 10-year period before age 65 discontinue cervical cancer screening with any modality (*qualified recommendation*)"*.[38] A Pap test is conducted as part of cervical cancer screening.[39]

*"A strong recommendation conveys the consensus that the benefits of adherence to that intervention outweigh the undesirable effects that may result from screening. Qualified recommendations indicate there is clear evidence of benefit of screening but less certainty about the balance of benefits and harms or about patients' values and preferences, which could lead to different decisions about screening."

CERVICAL CANCER SCREENING IN DELAWARE

The BRFS has collected data on cervical cancer screening in Delaware annually from 1995 to 2000 and biannually since then. In 2020 the BRFS showed that:

- Seventy-seven percent of Delaware women aged 21 to 65 years reported that they had had a Pap test within the previous three years, compared to the nation median of 80% among U.S. women of the same ages. Delaware ranked 31st highest among all states.
- In Delaware, the prevalence of receiving a Pap test in the past three years was slightly lower for Hispanic females (80%) compared to non-Hispanic White females and non-Hispanic Black females (78% vs. 83%, respectively). However, this difference was not statistically significant.
- As age increases, the prevalence increases for receiving a Pap smear within the past three years. Delaware women aged 21 to 30 had the lowest prevalence (67%) of receiving a Pap test in the past three years. The prevalence increases to 82% among Delaware women aged 46 to 55. However, this increase in screening compliance as age increase was not statistically significant.
- In Delaware, women aged 21 to 65 years with an annual household income of less than $15,000 (70%) had the lowest prevalence of receiving a Pap test within the past three years. Delaware women aged 21 to 65 with an annual household income of $50,000 or more (82%) had the highest prevalence of receiving a Pap test within the past three years. Differences among the different annual household income groups was not significant.
- Delaware women without a high school diploma had the lowest percentage of reporting having a Pap test within the past three years (59.2%). The percentage of Delaware women reporting having a Pap test in the past three years increased to 83.4% among women with a college degree. This difference between the lowest educational attainment category and the highest educational attainment category was statistically significant.

[38] Fontham ETH, Wolf AMD, Church TR, Etzioni R, Flowers CR, Herzig A, Guerra CE, Oeffinger KC, Shih YT, Walter LC, Kim JJ, Andrews KS, DeSantis CE, Fedewa SA, Manassaram-Baptiste D, Saslow D, Wender RC, Smith RA. Cervical cancer screening for individuals at average risk: 2020 guideline update from the American Cancer Society. CA Cancer J Clin. 2020 Sep;70(5):321-346. doi: 10.3322/caac.21628. Epub 2020 Jul 30. PMID: 32729638. https://acsjournals.onlinelibrary.wiley.com/doi/full/10.3322/caac.21628

[39] https://www.cancer.org/cancer/cervical-cancer/detection-diagnosis-staging/screening-tests/pap-test.html

COLORECTAL CANCER SCREENING RECOMMENDATIONS

The ACS and Delaware Cancer Consortium (DCC) colorectal cancer screening guidelines recommend that at 50 years of age, males and females at average risk of developing colorectal cancer should use one of the following screening options[40]:

a. Fecal occult blood tests (FOBT) every year
b. Fecal immunochemical test (FIT) every year
c. Flexible sigmoidoscopy every five years
d. Double-contrast barium enema every five years
e. Computed tomography (CT) colonography (virtual colonoscopy) every five years
f. Colonoscopy every 10 years.

For options 'a' through 'e,' a follow-up colonoscopy should be performed if results from an initial screening test are positive. ACS and DCC screening guidelines offer suggested screening schedules for individuals with an elevated risk of developing colorectal cancer.

COLORECTAL CANCER SCREENING IN DELAWARE

Data from the 2020 BRFS provides information on colorectal cancer screening patterns among Delawareans:

- Delaware ranked 10th highest in the prevalence (77%) of adults aged 50 to 74 years who reported meeting the U.S. Preventive Services Task Force (USPSTF) recommendations for colorectal screening. The U.S. national median for meeting the USPSTF recommendation for colorectal cancer screening was 74%.
- The percentage of Delawareans who met the USPSTF recommendation for colorectal cancer screening increased by age group. Significantly more Delawareans aged 60 to 69 years and aged 70 to 75 years (81% and 89%, respectively) reported meeting the recommendation, compared to those aged 50 to 59 years (66%).
- The prevalence of non-Hispanic Whites aged 50 to 74 years in Delaware who met the USPSTF recommendation for colorectal cancer screening (78%) was lower compared to the prevalence for non-Hispanic Black Delawareans (80%). However, this difference was not statistically significant.
- In Delaware, the prevalence of adults aged 50 to 74 years who met the USPSTF colorectal cancer screening increased by education level.
- As income increases, so does the prevalence of meeting the USPSTF recommendation for colorectal cancer screening. Delawareans who reported having the recommended colorectal cancer screenings differed significantly between income levels: 62% of Delaware adults in the lowest income category (less than $15,000 annual household income) reported meeting the USPSTF recommendation, compared to 79% in the highest income category ($50,000 or more).

LUNG CANCER SCREENING RECOMMENDATIONS

In January 2013, the ACS published new lung cancer screening guidelines[41] that recommend that doctors discuss screening options with patients who meet certain criteria for high risk of developing the disease. High-risk patients are defined as those who:

[40] Detailed screening guidelines for colorectal cancer: https://www.cancer.org/cancer/types/colon-rectal-cancer/detection-diagnosis-staging/acs-recommendations.html

[41] Wender, R., Fontham, E. T., Barrera, E., Jr, Colditz, G. A., Church, T. R., Ettinger, D. S., … Smith, R. A. (2013). American Cancer Society lung cancer screening guidelines. CA: a cancer journal for clinicians, 63(2), 107–117. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3632634/

- Are aged 55 to 74 years and in fairly good health
- Have a smoking history equivalent to a pack a day for 30 years or longer
- Currently smoke or have quit within the past 15 years.

If a high-risk individual decides to be screened for lung cancer, the ACS recommends that the testing be performed using a low dose computed tomography (CT) scan at a facility with experience in lung cancer screening. The guidelines emphasize that screening is not a substitute for quitting smoking.

LUNG CANCER SCREENING IN DELAWARE

Data from the 2020 BRFS provides information on lung cancer screening patterns among Delawareans:

- It is estimated that approximately 8% of Delaware adults between the ages of 55 and 80 may be eligible for lung cancer screening.
- The vast majority of Delaware adults eligible for lung cancer screening are White (93%). Therefore, breakdowns by race/ethnicity cannot be reported.
- Of Delaware adults eligible for lung cancer screening, only 14.6% reported having a CT scan to screen for lung cancer.
- Of Delaware adults eligible for lung cancer screening, there were no differences between Delaware males (16.2%) and Delaware females (14%) who reported having a CT scan to screen for lung cancer.
- Due to the low percentage of Delaware adults who are eligible being screened for lung cancer, breakdowns by annual household income and educational attainment cannot be reported due to small sample size.

PROSTATE CANCER SCREENING RECOMMENDATIONS

The ACS recommends that males make an informed decision with their health care provider about whether to be screened for prostate cancer. Males should receive information from their doctors about the risks and possible benefits of prostate cancer screening. Males should not be screened unless they receive this information[42].

The DCC recommends the following prostate cancer screening guidelines for Delaware males:

- 'No mass' prostate cancer screening efforts
- Promote education for informed prostate cancer screening decision-making.
- Screening in males older than 75 years of age is less desirable; however, screening decisions should be made on an individual basis.
- Screening is not recommended for males with a life expectancy of less than 10 years.
- Offer screening for individuals considered to be at average risk for the disease beginning at 50 years of age, using an informed decision-making process.
- High-risk individuals should be encouraged to be screened starting at 40 years of age if they:
  - Have first-degree relatives with prostate cancer
  - Are non-Hispanic Black males
  - Have family or personal history of BRCA1 or BRCA2 gene.
- Screening at one- to two-year intervals via prostate specific antigen (PSA) test, with or without digital rectal exam (DRE).

[42] American Cancer Society; Prostate Cancer: Early Detection. American Cancer Society Recommendations for Prostate Cancer Early Detection | American Cancer Society

PROSTATE CANCER SCREENING IN DELAWARE

Data from the 2020 BRFS provides information on the prevalence of prostate cancer screening among Delaware males:

- Thirty-three percent of Delaware males 40 years of age and older reported having had a PSA blood test in the past two years, compared to the national median prevalence of 32%. Delaware ranked 15th highest in the nation.
- The prevalence of Delaware males who received a PSA test within the past two years increased with age: 25% of males aged 50 to 59 years were tested, compared to 51% of males aged 65 years and older. This difference was statistically significant.
- In Delaware, there was no statistically significant difference in the prevalence of having a PSA test within the past two years between non-Hispanic White males (36%) and non-Hispanic Black males (26%).
- As the level of education increased, the prevalence of Delaware males who had a PSA test within the past two years increased. Only 19% of Delaware males with less than high school education reported having a PSA test within the past two years, compared to 41% of Delaware males who graduated from college. This difference was statistically significant.
- According to the 2018 BRFS, 44% of Delaware males reported making the decision together with their health care provider to have the PSA test done. Another 26% of Delaware males made the decision with one or more other person. Only 16% of Delaware males made the decision to have the PSA test done alone. Data about prostate cancer screening decision making was last asked in 2018.

APPENDIX E: BEHAVIORAL RISK FACTORS

CURRENT TRENDS IN SMOKING IN DELAWARE

The Behavioral Risk Factor Survey (BRFS) collects data annually on tobacco use among the Delaware population. Current smoking trends may be predictive of cancer rates in the 2030s. In the 1980s, the time period relevant to current lung cancer rates in terms of tobacco use behaviors, Delaware's smoking prevalence rates were among the highest in the country. Historical BRFS data show that in 1982, 30% of adult Delawareans smoked cigarettes. By the 1990s, Delaware's smoking rate among adults had declined to approximately 25%.

In recent years, tobacco use prevalence has continued to slowly decline among adult Delawareans and among high school students. In 2021, 15% of adult Delawareans smoked cigarettes regularly. The following data highlights smoking trends in Delaware in 2021:

- The prevalence for current smokers in Delaware (13%) is almost the same as the 2020 U.S. median prevalence of 14%.
- Delaware adult males (16%) had a significantly higher current smoking prevalence compared to Delaware females (11%).
- There were no differences in current smoking prevalence among non-Hispanic White (14%) and non-Hispanic Black (13%) in Delaware.
- When smoking prevalence was stratified by age group, Delawareans aged 35 to 44 reported the highest prevalence of current smoking (21%). This prevalence was statistically significantly higher compared to that for Delawareans 65 years of age and older.
- Current smoking prevalence changed with education attainment. In Delaware, 22% of residents who did not complete their high school education said they were current smokers. As education level increased, smoking prevalence decreased. Nineteen percent of Delaware adults who reported having a high school diploma or its equivalent reported being a current smoker, compared to 13% with some post-high school education, and 5% who completed college.
- Current smoking prevalence also decreased with higher income levels. In Delaware, 30% of Delaware adults with a household income between $15,000 and $24,000 were current smokers. The lowest smoking prevalence was among those who earned $100,000 to $199,999 per year (7%).

OVERWEIGHT/OBESITY

Being overweight or obese is a risk factor for numerous cancers, including female breast, colorectal, kidney, and uterine cancers. In addition, being overweight or obese is a major risk factor for other chronic diseases, including coronary heart disease, type 2 diabetes, and stroke.[43]

The Centers for Disease Control and Prevention (CDC) defines overweight as a body mass index (BMI) from 25 to less than 30 and obese as a BMI equal to or greater than 30. BMI is calculated using an individual's height and weight[44]. The following data are specific to the 2021 Delaware BRFS:

[43] Centers for Disease Control and Prevention. (2023, August 9). *Obesity and cancer*. https://www.cdc.gov/cancer/obesity/index.htm
[44] About BMI for Adults, http://www.cdc.gov/healthyweight/assessing/bmi/adult_bmi/index.html

- In Delaware, 69% of adults aged 18 years and older were overweight or obese in 2021, compared to the national median of 68%.
- In 2021, the prevalence of being overweight in Delaware differed significantly by sex: 40% of males and 30% of females were overweight.
- The prevalence of obesity among adult Delawareans did not differ by sex: 32% of males and 36% of females were obese in 2021.
- In 2021, the prevalence of being overweight was the same for non-Hispanic White (36%) and non-Hispanic Black (36%) Delawareans.
- In Delaware, non-Hispanic Blacks (40%) had a higher prevalence of obesity than non-Hispanic Whites (32%) in 2021. This difference was not statistically significant.
- In 2021, the prevalence of being overweight was highest among Delaware college graduates (36%).
- In 2021, as education increases, the prevalence of obesity decreases. However, there were no statistically significant differences among educational attainment groups.
- In 2021, there were no significant differences in obesity among those with different annual household incomes; adults with annual household income less than $15,000 had the highest obesity prevalence (45%).
- Among Delawareans in 2021, the prevalence of obesity was highest among those aged 45 to 54 years (40%).

PHYSICAL ACTIVITY

Lack of physical activity is a substantiated risk factor for colorectal cancer and a suspected risk factor for other cancers.[45] The benefits of regular, sustained physical activity includes reduced risk for chronic diseases including coronary heart disease, stroke, and type 2 diabetes; and improved well-being.[46]

The 2021 Delaware BRFS asks a question about participating in any physical activities in the past month.

The following data are from the 2021 Delaware BRFS:

- In Delaware, 73% of adults 18 years of age and older participated in any physical activities in the past month, similar to the national median of 76%.
- There was no difference in physical activity by race/ethnicity. In 2021, 75% of non-Hispanic Whites, 72% of non-Hispanic Blacks, and 83% of Hispanics participated in physical activity in the past month.
- More Hispanic (46%) and Black Delawareans (43%) did not meet aerobic or strengthening guidelines than Whites (33%). This difference was statistically significant.
- Significantly more college graduates participated in physical activity compared to any other educational attainment. In 2021, 84% of college graduates participated in physical activity, compared to 74% of adults with some post high school education and 69% of adults with a high school diploma or GED. Likewise, statistically fewer Delaware adults with less than a high school diploma (48%) participated in physical activities in the past month.

[45] Centers for Disease Control and Prevention. (2022, April 27). *Physical activity and cancer*. https://www.cdc.gov/physicalactivity/basics/pa-health/physical-activity-and-cancer.html
[46] Centers for Disease Control and Prevention. (2021, July 7). *Adults with chronic health conditions and disabilities*. https://www.cdc.gov/physicalactivity/basics/chronic-health-conditions-and-disabilities.html

- Delawareans in lower income categories reported a statistically significantly lower prevalence of participating in physical activities in the past month (52% of those earning less than $15,000; 59% of those earning $15,000 to $24,999 did not meet the guidelines). This compares to Delawareans in the highest income category, where 89% of those earning $200,000 or more per year participated in physical activities in the past month.

DIETARY FRUITS AND VEGETABLES

A diet high in fruits and vegetables is a protective factor against numerous cancers, including cancers of the breast, cervix, colon/rectum, uterus, esophagus, oral cavity, ovary, pancreas, prostate, and stomach. These questions are asked every other year.[47]

The following data are from the 2021 Delaware BRFS:

- In Delaware, 40% of adults consumed fruit less than one time per day, the same as the national median (40%).
- In 2021, 39% of Delaware adult females consumed fruit less than one time per day, compared to 43% of Delaware adult males. This difference was not statistically significant.
- There were no differences observed by race/ethnicity for fruit consumption: 41% of non-Hispanic Whites, 40% of non-Hispanic Blacks, and 31% of Hispanics consumed fruit less than one time per day.
- In Delaware, 21% of adults consumed vegetables less than one time per day, almost the same as the national median (20%).
- Delaware adult females reported consuming vegetables more often per day than Delaware adult males. In 2021, 26% of Delaware adult males consumed vegetables less than one time per day, compared to 16% of Delaware adult females.
- There were differences in daily vegetable consumptions by race/ethnicity groups. Only 16% of Delaware non-Hispanic Whites reported consuming vegetables less than one time per day, compared to 28% of non-Hispanic Blacks and 44% of Hispanics. The difference between non-Hispanic Whites and non-Hispanic Blacks and Hispanics was significantly different.

[47] National Cancer Institute. (2023, August). *Cancer Trends Progress Report: Fruit and vegetable consumption*. Fruit and Vegetable Consumption. https://progressreport.cancer.gov/prevention/fruit_vegetable